Cottonwood Creek
Fall Chinook Salmon
Carcass Survey

2012 Annual Report

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Abstract

Central Valley fall Chinook salmon *Oncorhynchus tshawytscha* are an important species for commercial and recreational fishing and fulfill important roles within the freshwater and marine ecosystems. To mitigate for water development projects and subsequent habitat loss, more than 32 million fall Chinook salmon are produced annually in California's Central Valley hatcheries. A large percentage of hatchery produced fall Chinook salmon juveniles are transported to San Pablo Bay for release, which increases their survival and availability for harvest. Transporting juvenile salmon, however, disrupts their natural outmigration process, which can lead to reduced imprinting on their natal water source. Adult salmon that stray into non-natal spawning areas can negatively impact wild populations. To evaluate straying of hatchery-origin fall Chinook salmon into Cottonwood Creek, a tributary of the upper Sacramento River, we performed carcass surveys of fall Chinook salmon in Cottonwood Creek in 2012. Coded-wire tags, biological and genetic samples, and associated information were collected from recovered carcasses to characterize and compare attributes of hatchery-and natural-origin salmon. We observed 1,080 carcasses during the 2012 survey period, representing 42% of the estimated escapement of fall Chinook salmon into Cottonwood Creek. During the week of 4 November 2012, 384 redds were counted in the survey area. The highest concentration of both redds and carcasses were found between stream miles 5 to 10, and the peak recovery of fresh carcasses occurred during the week of 28 October 2012. Twenty-five percent of the fall Chinook salmon in Cottonwood Creek were estimated to be of hatchery origin. About half of hatchery-origin carcasses recovered were fall Chinook salmon from the Coleman National Fish Hatchery (52%) and the remaining salmon were fall Chinook salmon from the Feather River Fish Hatchery (41%).

Introduction

Annually, more than 32 million fall Chinook salmon (FCS) are currently produced at five fish hatcheries in the Central Valley of California, including Coleman National Fish Hatchery (NFH), Feather River Fish Hatchery and the Feather River Hatchery Annex, Nimbus Fish Hatchery, Mokelumne River Fish Hatchery, and Merced River Fish Hatchery (Kormos et al. 2012). Hatchery production of Central Valley FCS contributes substantially to sport and commercial fisheries in ocean and inland areas. Releasing large numbers of hatchery propagated salmonids, however, can result in negative effects to naturally-produced salmonids. For example, artificial propagation can pose genetic risks to natural salmonid populations which can affect locally adapted gene complexes and have deleterious effects on fitness or survivorship (Hard et al. 1992; Cuenco et al. 1993; Waples 2007).

The potential for hatchery-origin salmon to negatively affect natural-origin salmonids is reduced when hatchery-origin salmon return, as adults, to their hatchery of origin, or "home", and is greater when hatchery-origin salmon spawn in non-natal streams, or "stray" (Quinn et al. 1991; Williamson and May 2005). Natural-origin salmon typically show a high level of fidelity to their natal spawning areas which results from imprinting on environmental cues during juvenile rearing and emigration (Dittman and Quinn 1996).

Imprinting is disrupted and straying is increased for hatchery-origin salmon that are released at locations distant from the hatchery (Quinn 1993; Dittman and Quinn 1996). In recent years,

many of the FCS produced at Central Valley hatcheries have been transported by truck to the downstream limit of the watersheds, where they are typically acclimated to estuarine water conditions for several hours in net pens and released into San Pablo Bay. This practice has been shown to increase survival of juveniles by bypassing mortality that would otherwise occur during emigration, resulting in an increased abundance of salmon available for harvest (Kormos et al. 2012). At the same time, the practice of transporting juvenile salmon has also raised concerns about negative effects to naturally spawning salmon populations that may result from straying of adult hatchery-origin FCS (Williamson and May 2005).

Assessments of straying of adult hatchery-origin FCS in the Central Valley have been limited by low and inconsistent rates of marking or tagging of hatchery salmon. Inadequate marking and tagging programs result in the inability to distinguish hatchery- and natural-origin FCS when they return to hatcheries and in natural spawning areas. Beginning in 2007, however, a representative portion of all hatchery production of FCS in the Central Valley has been marked with an adipose fin-clip and a coded-wire tag (CWT) has been inserted in the nasal cartilage. This program, called the Constant Fractional Marking (CFM) Program, targets 25% of FCS production releases to be marked and tagged on an annual basis (Buttars 2011). The overall objectives of the CFM program are:

1. To evaluate the contribution rates of hatchery fish to Central Valley Chinook salmon populations;
2. To evaluate the Central Valley propagation program's genetic and ecological effects on natural Chinook salmon populations;
3. To estimate exploitation rates of hatchery and natural Central Valley Chinook salmon in ocean and inland fisheries;
4. To evaluate the success of restoration actions designed to increase natural production of Central Valley Chinook salmon;
5. To evaluate the relative impacts of water project operations on hatchery and naturally-produced Chinook salmon; and,
6. To evaluate the recovery of listed stocks of Chinook salmon (Buttars 2011).

To meet the objectives of the CFM program, rigorous field sampling programs are necessary to survey natural spawning areas. In 2011, the California's Central Valley Salmonid Escapement Project Work Team distributed a plan to provide a framework for long-term monitoring programs to estimate, in a statistically valid manner, the abundance and trends in escapement of adult Central Valley Chinook salmon at the watershed level (Bergman et al. 2012). The main objective of this Central Valley In-river Chinook Salmon Escapement Monitoring Plan is to improve estimates of the total number of Chinook salmon that "escape" fisheries and return to natural spawning areas (i.e., 'escapement') and estimate the percent of escapement that are of hatchery origin. Biological data (e.g., sex ratios, age, and length distributions) and data collected during surveys of natural spawning areas are also used to enhance understanding of the life history, status, and health of each stock, and to improve the management of the salmon stocks. This monitoring plan calls for systematic surveys of important spawning areas of the Central Valley to collect biological data and recover CWTs (Bergman et al. 2012).

Cottonwood Creek is a tributary on the west side of the upper Sacramento River (confluence river mile [RM] 273). The Cottonwood Creek watershed, with its headwaters originating in the North Coast Mountain Range and Klamath Mountains, encompasses 929 square miles and has three main tributaries: the South Fork, the North Fork, and the Middle Fork (Figure 1). Cottonwood Creek has steep, narrow canyons starting from the headwaters and transitioning to wide, braided alluvial streams in the valley reach (CH2M Hill 2002). The watershed provides approximately 130 miles of potential spawning habitat for fall, late-fall, and spring Chinook salmon and steelhead trout (CH2M Hill 2002). Historically, escapement surveys in Cottonwood Creek have been infrequent and have varied in location, method, and methodology for estimating abundance, which produced sporadic and highly variable estimates of population size (CH2M Hill 2002, CalFish.org).

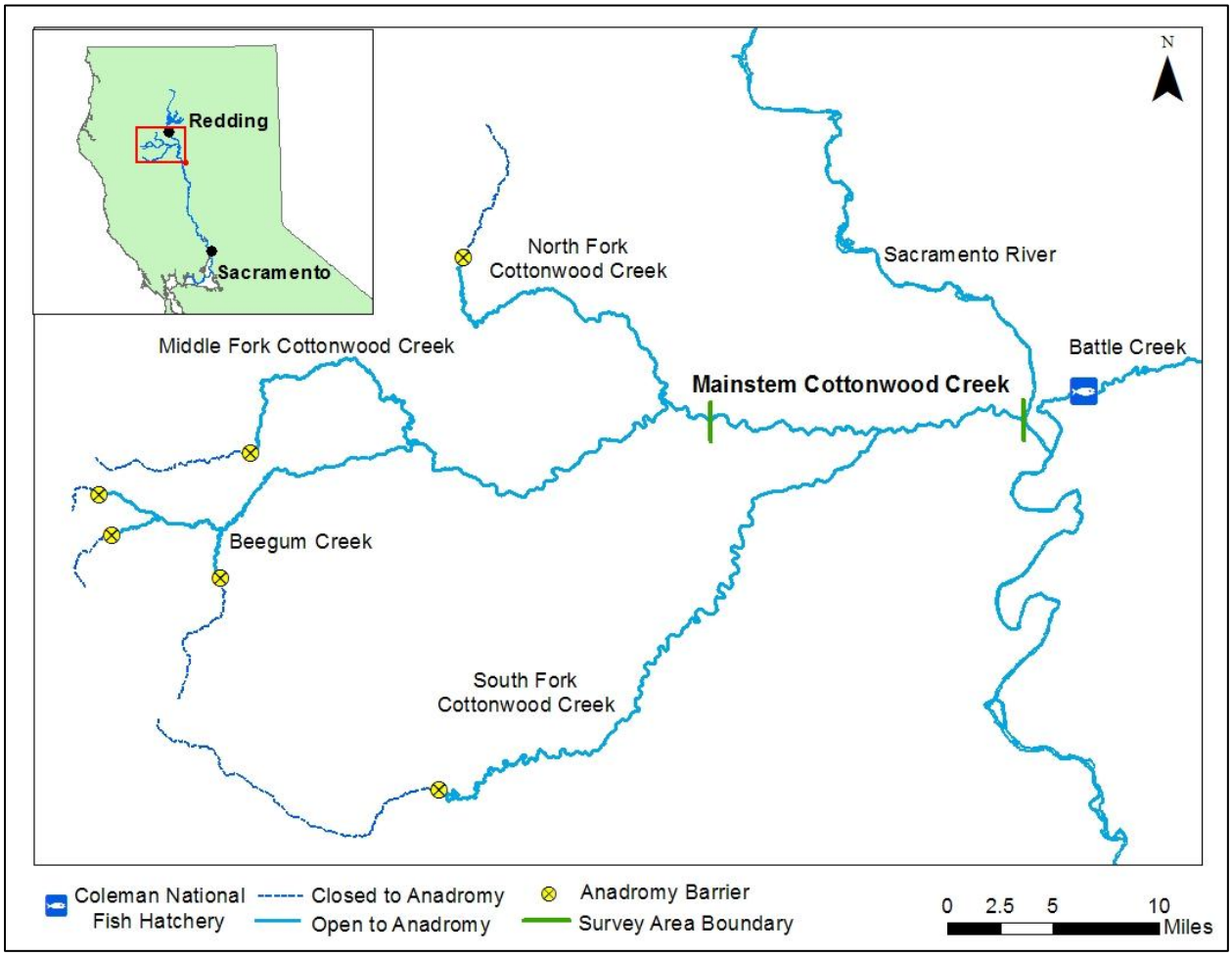

Figure 1. Map of the Cottonwood Creek watershed. Expanded area is indicated in red on the California state map. (Source: CH2M Hill 2002).

Starting in 2007, California Department of Fish and Wildlife (CDFW) staff installed a partial weir and video monitoring equipment near the mouth of Cottonwood Creek to monitor the total salmon escapement into Cottonwood Creek (Grifantini et al. 2011, Killam and Merrick 2012). As such, these video surveys are used to estimate the total adult salmon escapement into Cottonwood Creek, and the data collected during the carcass surveys referenced in this report are

a subset of the salmon counted during the video surveys. In 2010, an additional underwater camera was installed to determine if returning salmon had an adipose fin (Table 1). Full details of the design, function and results of the previous years' FCS video monitoring can be found in Killam and Merrick (2012). Spawning area carcass surveys provide additional data that complement video monitoring, including sex, fork length, and CWT recoveries. The CWT recoveries provide hatchery of origin and age class structure and afford the ability to expand CWT data to account for unmarked hatchery-origin salmon.

Table 1. Numbers of fall Chinook salmon observed during video monitoring in Cottonwood Creek from 2007 through 2012. Adipose fin-clipped fall Chinook salmon were enumerated beginning in 2010 and the percentage of those salmon within the estimated population is provided in parentheses for that year (Source: Killam and Merrick 2012, D. Killam, California Department of Fish and Wildlife, personal communication).

Year	# of fall Chinook observed
2007	1250
2008	510
2009	1065
2010	1,139 (8.1%)
2011	2,144 (10.9%)
2012	2,556 (5.6%)

The goal of this monitoring project, which started in 2011, is to collect CWTs, biological and genetic samples, and associated information from FCS in Cottonwood Creek, as recommended in the Central Valley In-river Chinook Salmon Escapement Monitoring Plan (Bergman et al. 2012). This information will be used to estimate the proportion of hatchery- and natural-origin FCS within the survey area, determine the hatchery of origin for hatchery produced salmon straying into Cottonwood Creek, estimate the sex ratio of FCS within the survey area, and determine the age class structure of hatchery-origin FCS. Additionally, the study was designed to provide information on the spatial distributions of salmon carcasses and redds.

Methods

Survey Area

We surveyed lower elevation areas of Cottonwood Creek, where FCS typically spawn, from the confluence with the Sacramento River upstream for approximately 19.2 miles, with the survey area divided into three reaches. Reach 1, the farthest upstream from the confluence of Cottonwood Creek and the Sacramento River, extended from stream mile (SM) 19.2 to SM 14.1. Reach 2 extended from the downstream limit of Reach 1 to SM 6.7. During the peak of the season, reach 2 was broken down into multiple sub-sections and accessed from several different locations within the reach in order to reduce survey times. Reach 3 extended from SM 6.7 to the confluence of Cottonwood Creek with the Sacramento River. The take-out point for reach 3 was on the Sacramento River at the Steelhead Landing Boat Ramp in Lake California, an additional 1.1 miles downstream of the confluence of Cottonwood Creek (Figure 2).

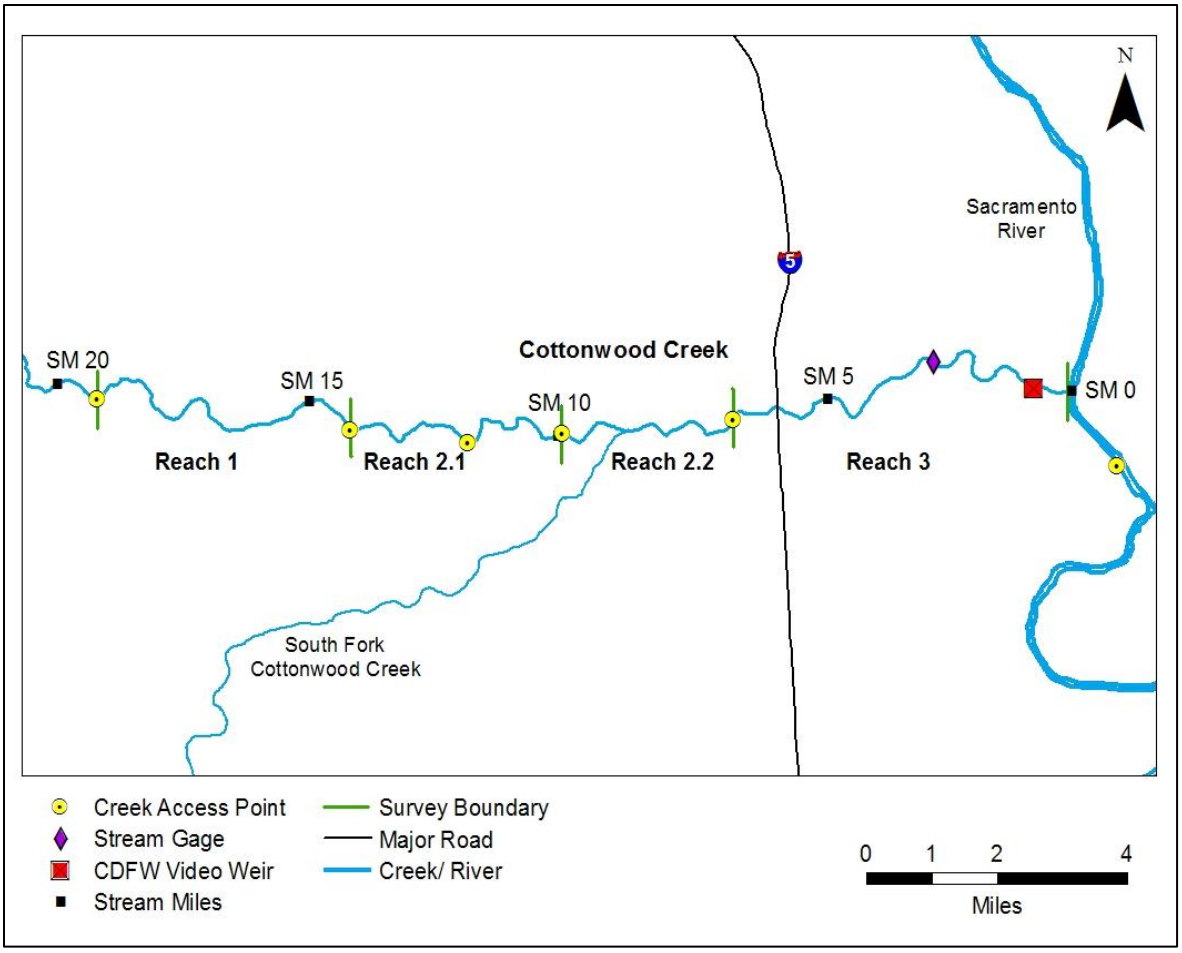

Figure 2. Fall Chinook salmon carcass survey area on Cottonwood Creek during fall 2012.

Sampling Protocol

The survey extended from 9 October 2012 through 27 November 2012 and encompassed a majority of the period of FCS spawning in Cottonwood Creek. The survey began prior to the beginning of most FCS spawning in Cottonwood Creek, but was terminated earlier than anticipated, because high flows from a storm event prevented crews from safely surveying the creek. Each of the three reaches was surveyed weekly, beginning with the reach farthest downstream and moving upstream on subsequent days. During most weeks, multiple reaches were surveyed simultaneously by different crews to increase the efficiency of shuttling vehicles. In 2012, multiple beaver dams on Reach 2 (SM 7, SM 8, SM 11, SM 12 and SM 13) acted as intermittent barriers to FCS passage. No salmon were observed above these beaver dams on surveys conducted on 10 October 2012, and live salmon were observed congregating below the beaver dams. Therefore, Reach 1 was not surveyed during the weeks of 14 October, and 28 October. Additionally, Reach 1 was not surveyed on 18 November, and 25 November because we were unable to access the creek through private property.

To survey a reach of the creek, two observers kayaked downstream, with each observer focusing attention from the center of the creek to opposite banks. Sampling gear included a data sheet, global positioning system (GPS) device, specimen vials, specimen knives, gaff hook, and a machete. Operator position on the kayak was generally in an upright kneeling position to

encompass greater visibility of the creek while paddling. The depth of the creek was variable and at times it became so shallow that it was necessary to walk portions of the creek while surveying.

Carcasses were recovered using a 1.5 meter gaff hook as well as hand-picking from the shoreline or in shallow waters. The physical condition of each carcass was estimated as "fresh", "non-fresh", or "very non-fresh". A carcass was considered "fresh" if it had at least one clear eye, relatively firm body texture, or pink gills; "non-fresh" if the eyes were cloudy, the gills were no longer pink or the body texture had softened slightly; and "very non-fresh" if it was in a decomposed state and the body was very soft and flaccid. Data collected from carcasses included: date, location (survey reach, GPS waypoint), sex, spawn status (spawned, un-spawned, and unknown), fork length, and adipose fin status (absent, present, and unknown). Spawn status for females was defined as spawned (abdomen extremely flaccid and very few eggs remaining), un-spawned (abdomen firm and swollen or many eggs remaining), or unknown (indeterminable spawn status, usually due to predation on the carcass). The spawn status for males was always categorized as unknown. Adipose fin status was categorized as either "absent", indicating the adipose fin was missing from the salmon due to removal prior to being released from a hatchery, "present", indicating the adipose fin was intact on the carcass, or "unknown", which typically resulted when a carcass was either very deteriorated or had been subject to predation. The head and a tissue sample were collected from salmon with an adipose fin status of absent or unknown. Collected heads were transported to the Red Bluff Fish and Wildlife Office (RBFWO) and subsequently processed for CWT recovery. Carcasses of unknown fin status were subsequently reclassified as "absent" if a CWT was recovered from the head or "present" if no CWT was recovered. A small piece of fin tissue, for genetic run determination, and a patch of scales, for age-class determination, were collected from fresh carcasses. Fin tissues were preserved in 100% ethanol and archived in the USFWS salmonid tissue archive at RBFWO. Scale patches were air dried prior to transferring to the CDFW Central Valley scale ageing project. After data were recorded and samples collected from individual salmon, the carcass was cut in half with a machete to prevent resampling, and returned to the creek.

Stream discharges during the survey period were assessed by retrieving data from the U.S. Geological Survey (USGS) Water Data for the Nation website (http://nwis.waterdata.usgs.gov/nwis) from gaging station Cottonwood Creek near Cottonwood, CA (USGS 11376000). Data from the gage were also used to assist in assessing creek conditions and the ability of observers to safely and adequately conduct the surveys.

Redd Sampling

Surveys were performed 6 November 2012 through 8 November 2012 to estimate the number and distribution of redds in Cottonwood Creek. Redd locations were marked with a GPS point. Locations with several redds in close proximity were marked with a single GPS point, and the number of redds was noted. Due to time constraints of the large run size in 2012, each reach was only surveyed once toward the end of the spawning season.

Data Analysis

The process for removing and decoding CWTs in recovered salmon is described in U.S. Fish and Wildlife Service (2005). Age, hatchery of origin, release group size, and release location were

determined by querying the tag codes in the Regional Mark Information System (RMIS; www.rmpc.org). The age of CWT salmon was determined by identifying brood year relative to return year. Spatial distribution and sex composition were compared between natural-origin and hatchery-origin carcasses.

An expansion factor was calculated for each CWT group, using the equation shown below. The expanded number (i.e., total number of salmon represented by that CWT code) was estimated by dividing the number of salmon recovered with that CWT code by the expansion factor.

$$Expansion\ Factor = \frac{number\ of\ marked\ and\ tagged\ juvenile\ fish\ in\ a\ CWT\ group}{total\ marked\ and\ unmarked\ juvenile\ fish\ represented\ by\ the\ CWT\ group}$$

For example, if a CWT is recovered from a group of salmon that had a 25% mark rate, then the expansion factor for this particular CWT would be 0.25, and the expanded number for each salmon recovered would be 4. In this case, each CWT recovery represents four hatchery-origin salmon, including one marked salmon and three unmarked salmon. Based on these expanded numbers, hatchery-origin contribution percentages were calculated. Application of CWT expansions assumed that a recovered marked salmon represented three additional unmarked salmon with similar biological data and distribution (e.g. sex, hatchery of origin, and survey reach). Assumptions were not applied to recovery date, fork length, or distribution based on stream mile due to a small sample size for each of these metrics.

Results

Carcass Recoveries

We observed 1,080 carcasses during the survey period, representing 42% of the total FCS escapement (N = 2,556) into Cottonwood Creek in 2012, as estimated at the Cottonwood Creek video weir (D. Killam, pers. comm.). Biological data, such as fork length, sex, and spawn condition, was recorded for 987 carcasses, and 284 fin tissue samples and 242 scale patches were collected. All data presented are based on the 987 carcasses with associated biological data unless otherwise noted. Two hundred twenty five fresh, 633 non-fresh and 128 very non-fresh carcasses and 93 intact skeletons were recovered; carcass condition was not recorded for one carcass.

Coded-wire Tag Recoveries

The heads were collected from 81 salmon carcasses, including 68 from salmon with an absent adipose fin and 13 from salmon with an unknown adipose fin status. A CWT was recovered from 67 of the heads collected. Tags were not detected in 12 heads (3 absent adipose fin and 9 unknown adipose fin status) and two tags from heads with an absent adipose fin status were lost during extraction. Four of the 13 heads collected from carcasses with unknown adipose fin status contained a CWT. The 9 carcasses of unknown adipose fin status from which no CWTs were recovered were reclassified as "present" adipose fin status for subsequent analyses. The carcasses with the 2 lost CWTs and the 3 heads without a CWT from an absent adipose fin carcass, were categorized as "No CWT" and grouped with hatchery-origin salmon for subsequent analyses.

Hatchery-origin Returns

Application of the expansion factors to the 72 hatchery-origin salmon (67 CWT recoveries and 5 "No CWT") to account for unmarked hatchery production yields an estimate of 247 hatchery-origin salmon recovered in the survey area, representing 25.0% of all sampled carcasses (Appendix I). An expansion factor (0.294) was calculated for the five hatchery-origin carcasses categorized as "No CWT" based on the proportion of CWT recoveries from salmon marked at a 25% rate (81%) and the proportion marked at a 100% rate (19%). Most FCS are marked at Central Valley fish hatcheries at a 25% rate, but some experimental release groups of FCS are marked at a 100% rate.

CWT recoveries were classified as: Coleman NFH FCS onsite releases (N = 19 recovered, N = 76 expanded), Coleman NFH FCS offsite (San Pablo Bay) releases (N = 13 recovered, N = 52 expanded), Feather River Fish Hatchery FCS offsite (San Pablo Bay, San Francisco Bay, and Santa Cruz) releases (N = 35 recovered, N = 102 expanded), or no CWT (N = 5, N = 17 expanded) (Figure 3). No late-fall Chinook salmon or spring Chinook salmon were recovered. Twenty-eight percent of recovered males were of hatchery-origin, and 21% of recovered females were of hatchery-origin.

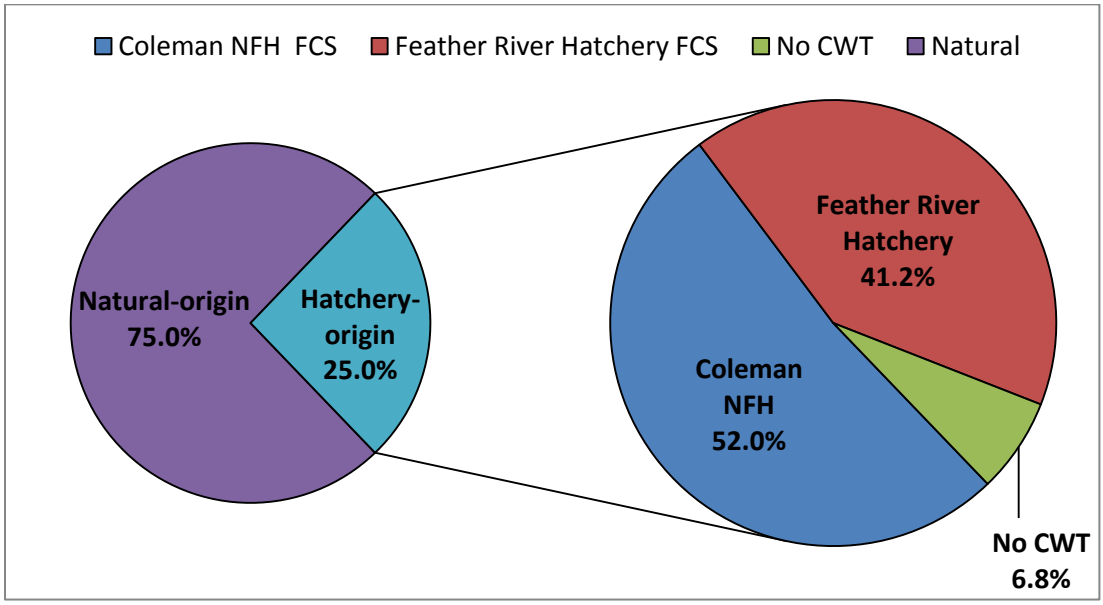

Figure 3. Hatchery contributions to 2012 fall Chinook salmon carcass recoveries in Cottonwood Creek based on CWT expansions.

Temporal and Spatial Distribution

A total of 225 fresh carcasses were recovered with the peak recovery of fresh carcasses during the week of 28 October 2012 (28 October 2012 – 3 November 2012). Recoveries of fresh carcasses were highest before and during this week with 69% of fresh females and 75% of fresh males recovered during this time (Figure 4). Non-fresh carcass recoveries were more prevalent after the week of 28 October 2012. The peak passage of FCS through the video station (N = 811) also occurred during the week of 28 October 2012 (D. Killam, pers. comm.).

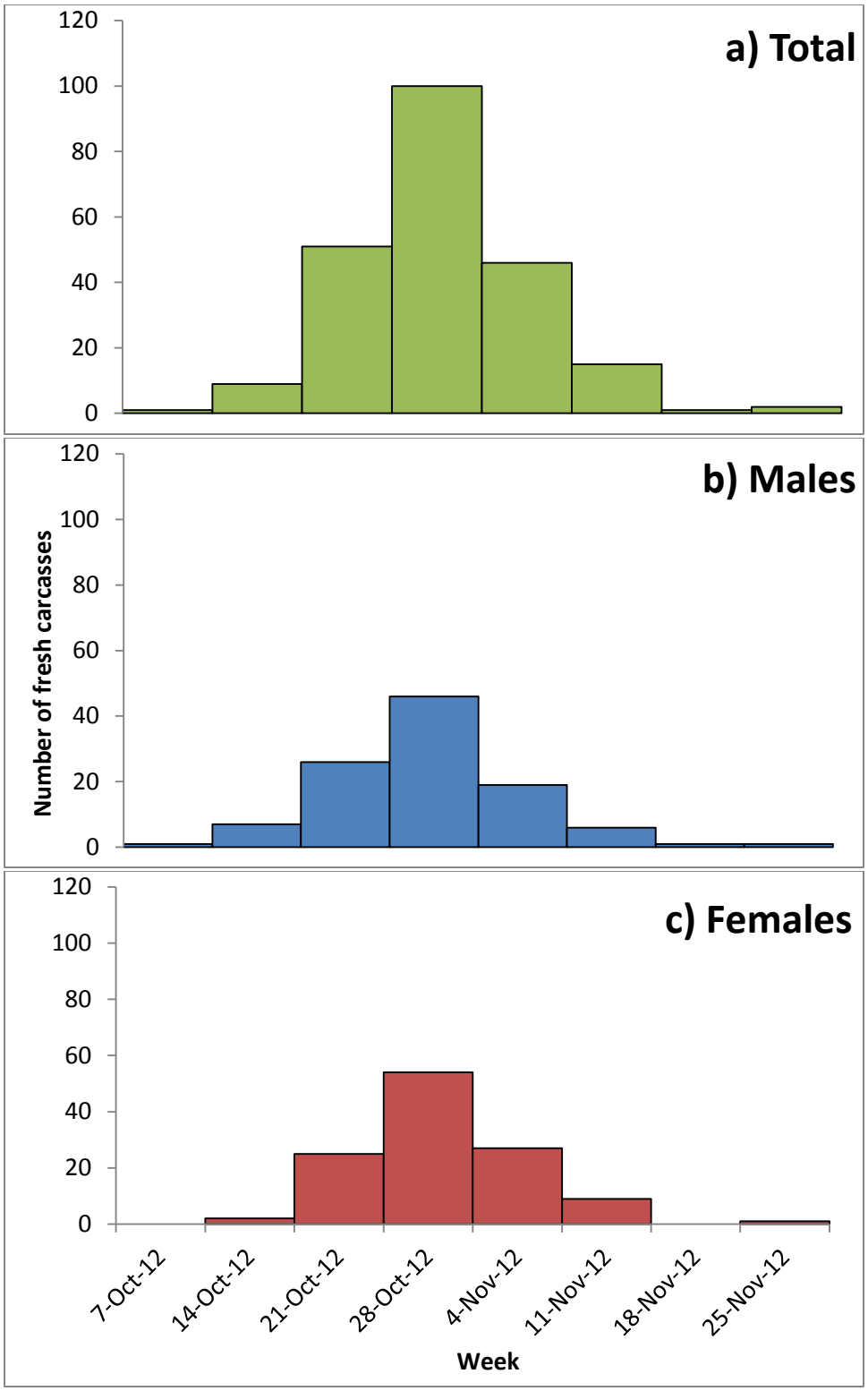

Figure 4. Weekly numbers of fresh fall Chinook salmon carcass recovered in Cottonwood Creek, a) total number of fresh carcasses, b) number of fresh male carcasses, c) number of fresh female carcasses.

The majority of the recovered carcasses (66.3%) were found between SM 5 and SM 10 (*N* = 654). The greatest number were found in SM 9 (*N* = 165; Figure 5).

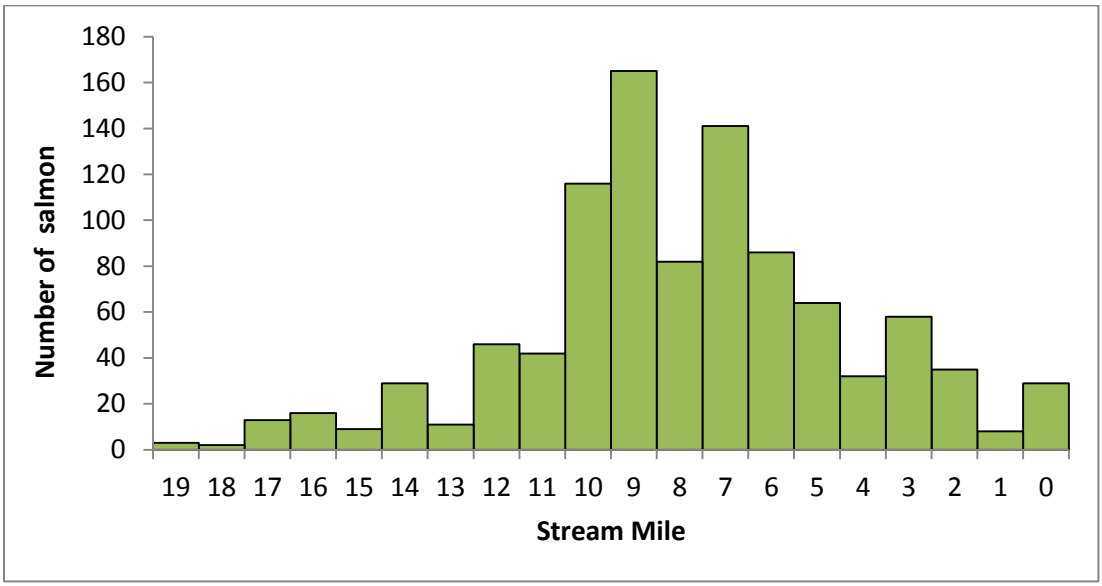

Figure 5. Fall Chinook salmon carcass distribution by stream mile in Cottonwood Creek during fall 2012.

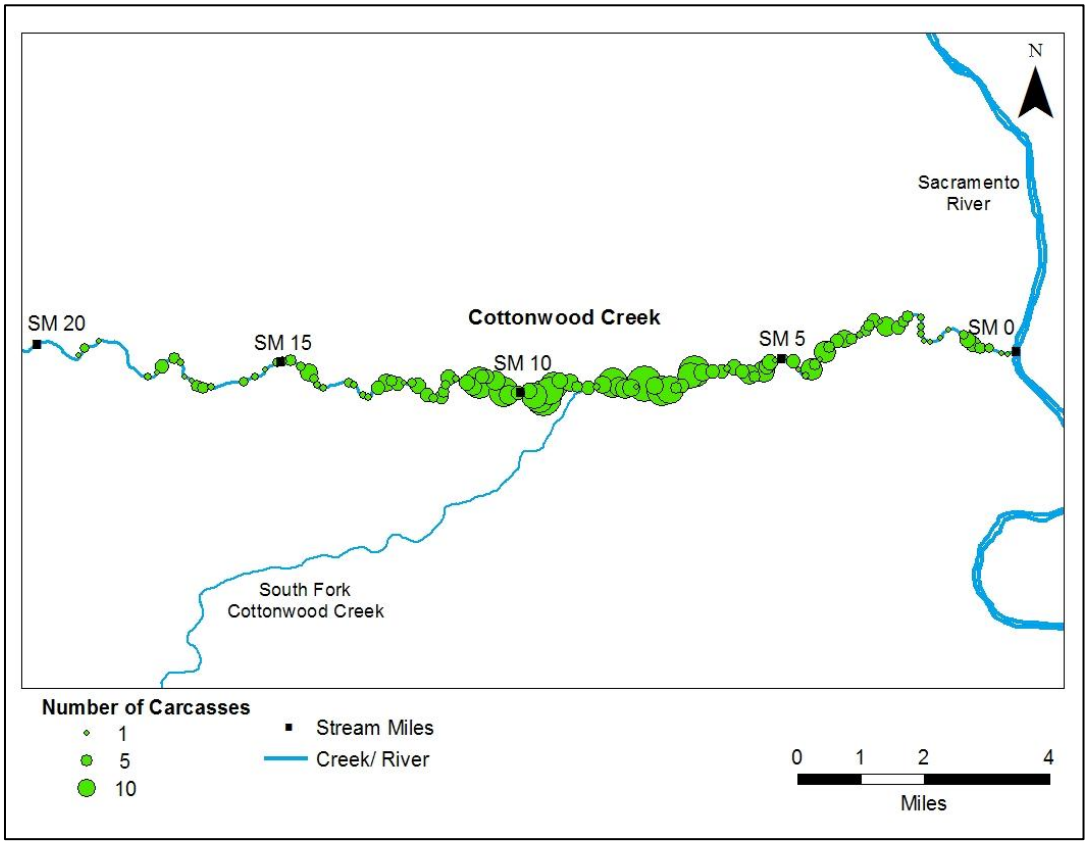

Figure 6. Map of fall Chinook salmon carcass distribution on Cottonwood Creek during fall 2012.

The peak recovery area of carcasses was between SM 5 and SM 10 (Figure 6). Distributions of male and female carcasses in the survey area were generally similar (Figure 7). Beaver dams were noted throughout the season at SM 7, SM 8, SM 11, SM 12 and SM 13 and were observed to intermittently hinder or block upstream passage.

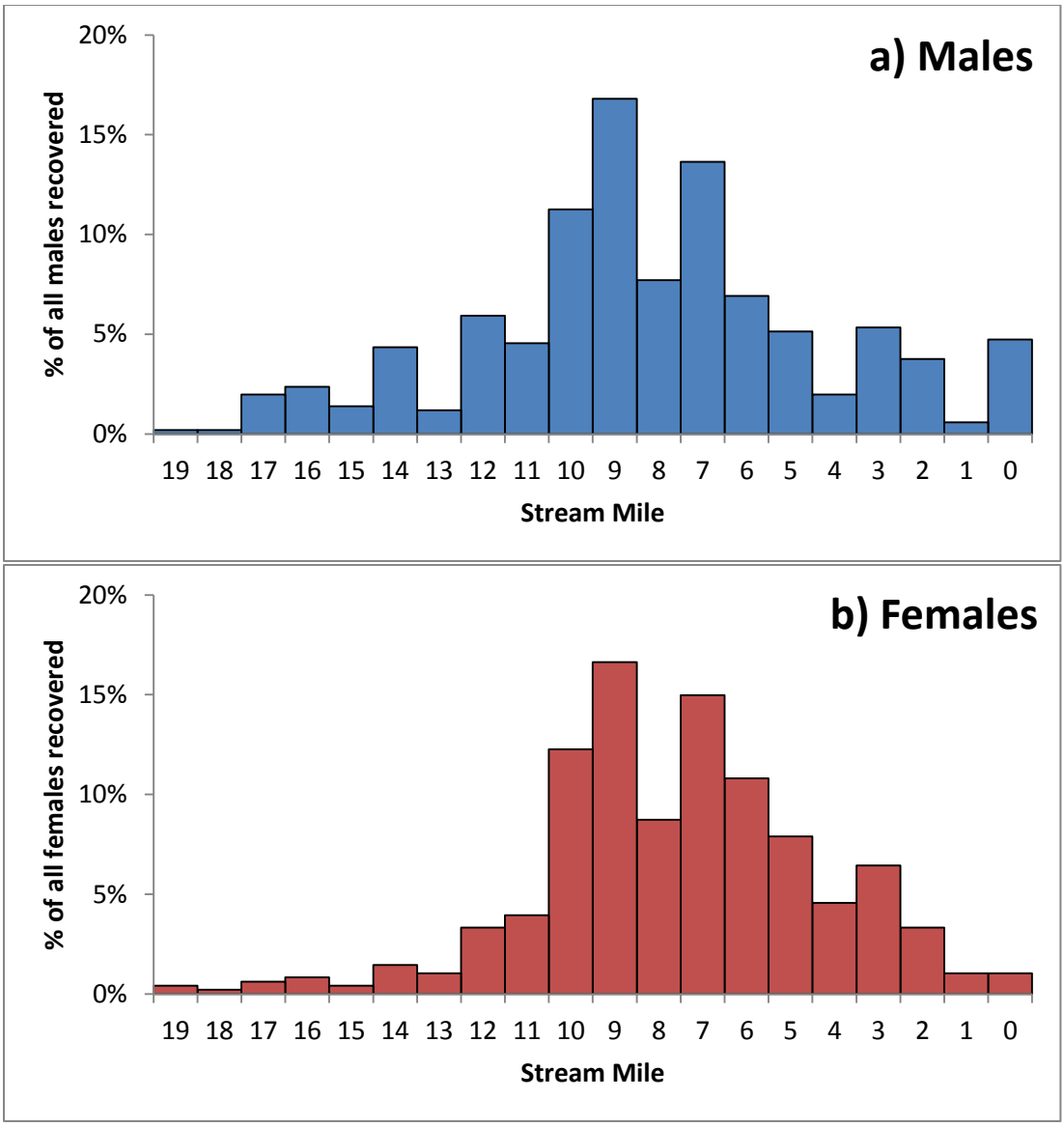

Figure 7. Proportion of total carcass recoveries for a) males, and b) females based on recovery location of fall Chinook salmon carcasses in Cottonwood Creek during fall 2012.

The percentage of hatchery-origin salmon recovered decreased for both males and females in survey areas farther upstream from the confluence with the Sacramento River (Figure 8). Hatchery-origin males comprised 48% of recoveries in SM 0- 5, 29% of recoveries in SM 6-11, and 7% of recoveries in SM 12-19. Hatchery-origin females comprised 45%, 14% and 6% of recoveries in SM 0-5, SM 6-11 and SM 12-19, respectively.

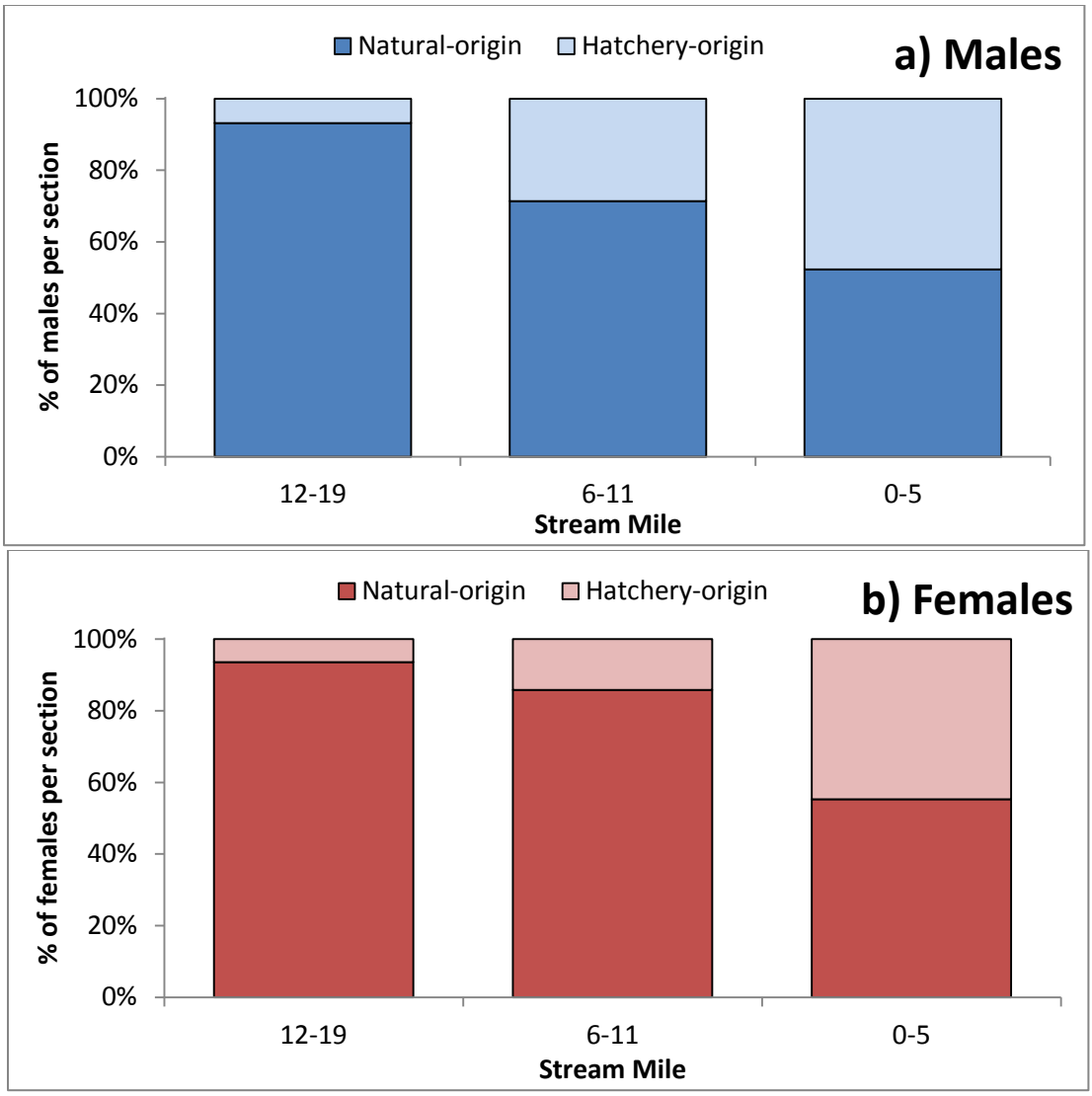

Figure 8. Percent of natural-origin and hatchery-origin fall Chinook salmon for a) male carcasses and b) female carcasses recovered in Cottonwood Creek during fall 2012.

Composition and Length-at-Age

Lengths of salmon carcasses were bi-modally distributed, with modes at approximately 590 mm and 790 mm. Length distribution of male carcasses showed a nadir separating the modes at approximately 700 mm (Figure 9). A length of 700 mm was used to estimate proportions of grilse (age-2) and adult (age-3 and age-4) males, with salmon ≥ 700 mm considered to be adults (68.2%; $N = 345$) and salmon < 700 mm considered to be grilse (31.8%; $N = 161$). Female carcass lengths were approximately normally distributed, likely because few females return at age-2. This assumption was supported by the lack of grilse females amongst CWT recoveries (Figure 10). A grilse cutoff was therefore not determined for females due to the lack of a distinct bimodal distribution in the female size distribution. Fork length was not recorded for one female carcass, which was not included in this analysis.

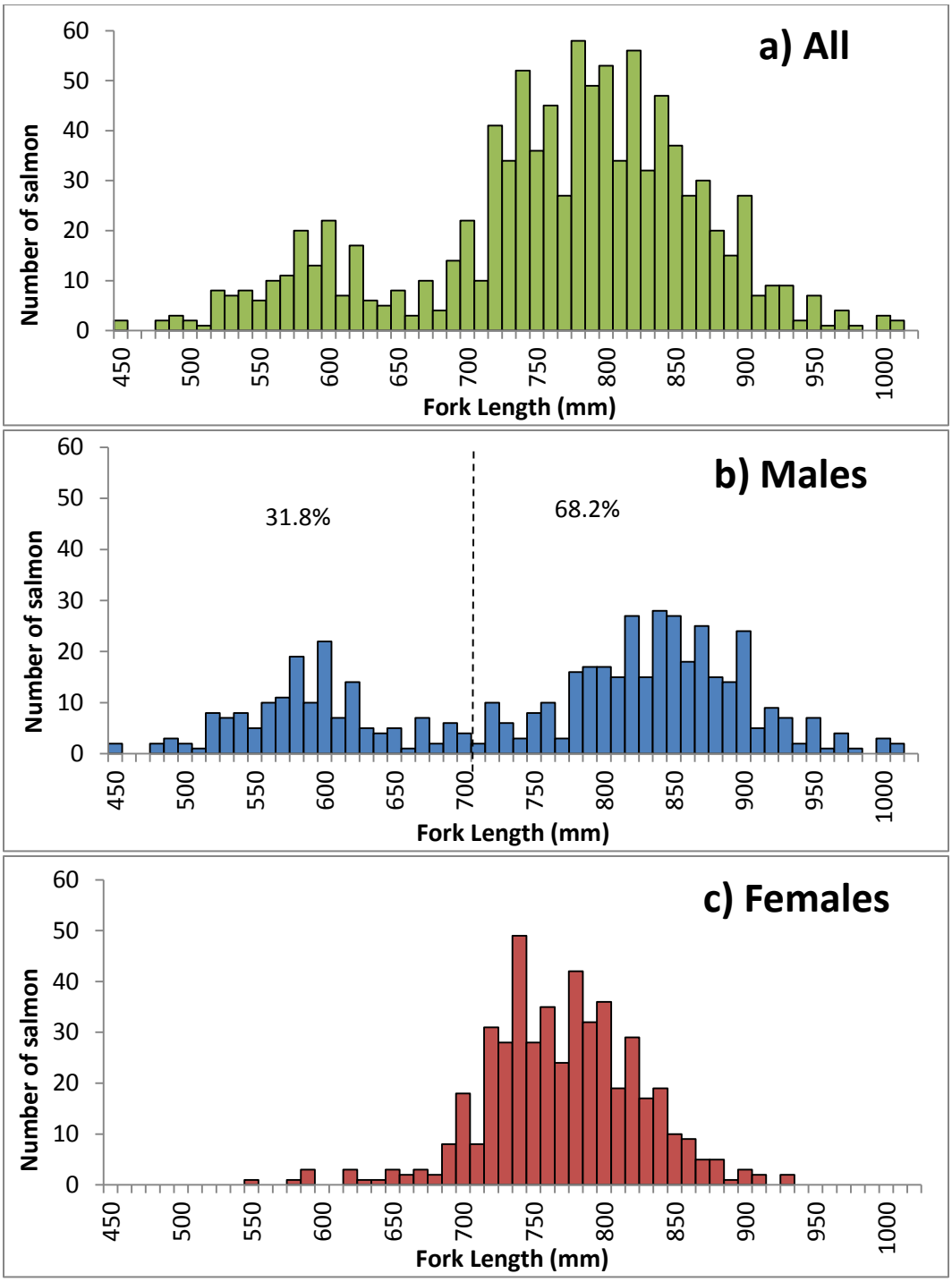

Figure 9. Length frequency distributions of fall Chinook salmon carcasses recovered on Cottonwood Creek during fall 2012. a) all carcasses (*N* = 986) b) male carcasses (*N* = 506) c) female carcasses (*N* = 480). An estimated grilse cutoff was set at ≥ 700 mm and is shown as a dotted black line for males. Percentages of salmon longer and shorter than this cutoff are shown. A grilse cutoff was not determined for females due to small sample size.

Based on expanded numbers from recovered CWTs, 15.7% of hatchery-origin carcasses were grilse (*N* = 36) and 84.3% were adult (*N* = 194). All adults recovered were age-3. One hundred percent of hatchery-origin females were adults (*N* = 95), whereas 26.7% of hatchery-origin male carcasses were grilse (*N* = 36) and 73.3% were adults (*N* = 99) (Figure 10).

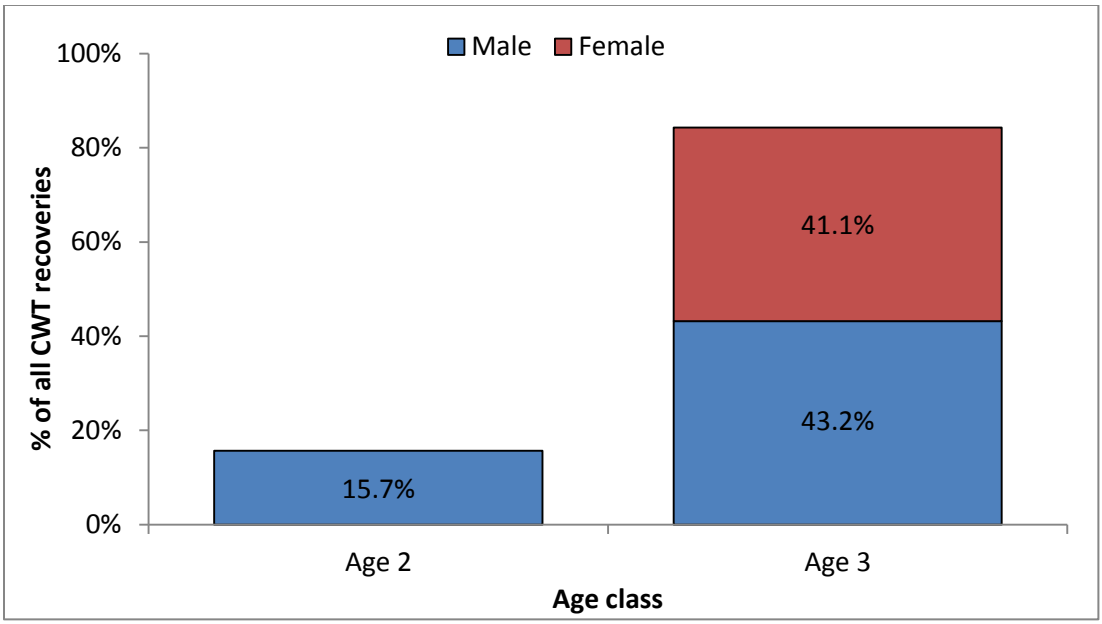

Figure 10. Age composition by sex of hatchery-origin fall Chinook salmon carcasses recovered in Cottonwood Creek during fall 2012.

Sex Ratio

Of the 987 carcasses recovered, 506 were males and 481 were females for a sex ratio of approximately 1.1: 1. The sex ratio for hatchery-origin males (*N* = 146) to hatchery-origin females (*N* = 101) was slightly higher at 1.4: 1, based on expanded CWT recoveries. The sex ratio for natural-origin males (*N* = 360) to natural-origin females (*N* = 380) was slightly lower at 0.9: 1, based on the assumption that the number of natural-origin males and females equals the total number of each sex minus the CWT expansion number.

Redds

A total of 384 redds were found in Cottonwood Creek during the week of 4 November 2012. No redds were observed within 1 mile of the confluence with the Sacramento River, or in the uppermost mile of the survey area (Figure 11). The stream mile with the highest concentration of redds was in SM 9 (*N* = 47; Figure 11); 60% of redds were found between SM 5 to SM 10. Twenty-one percent of redds were found downstream of SM 5 while 19% were found upstream of SM 10 (Figure 12).

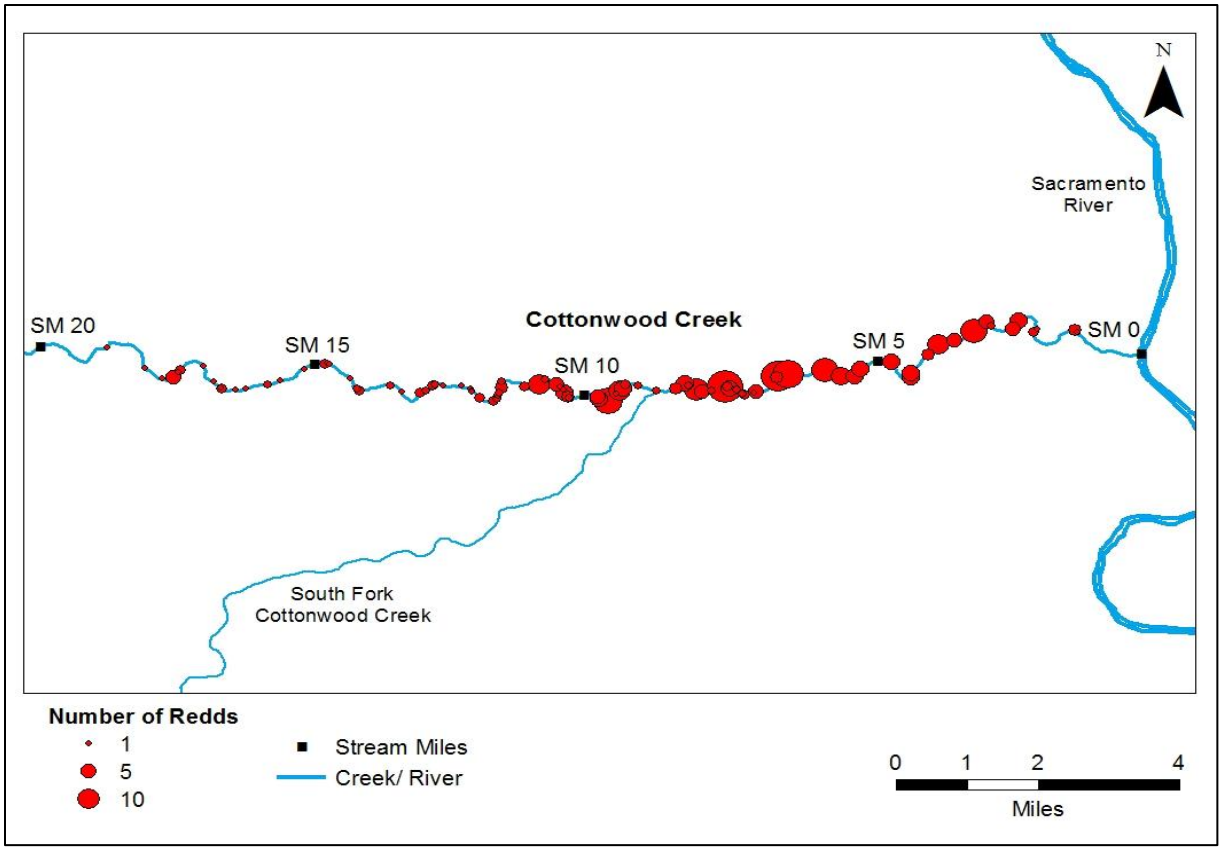

Figure 11. Map of redd distribution and abundance in Cottonwood Creek from 6 November 2012 through 8 November 2012.

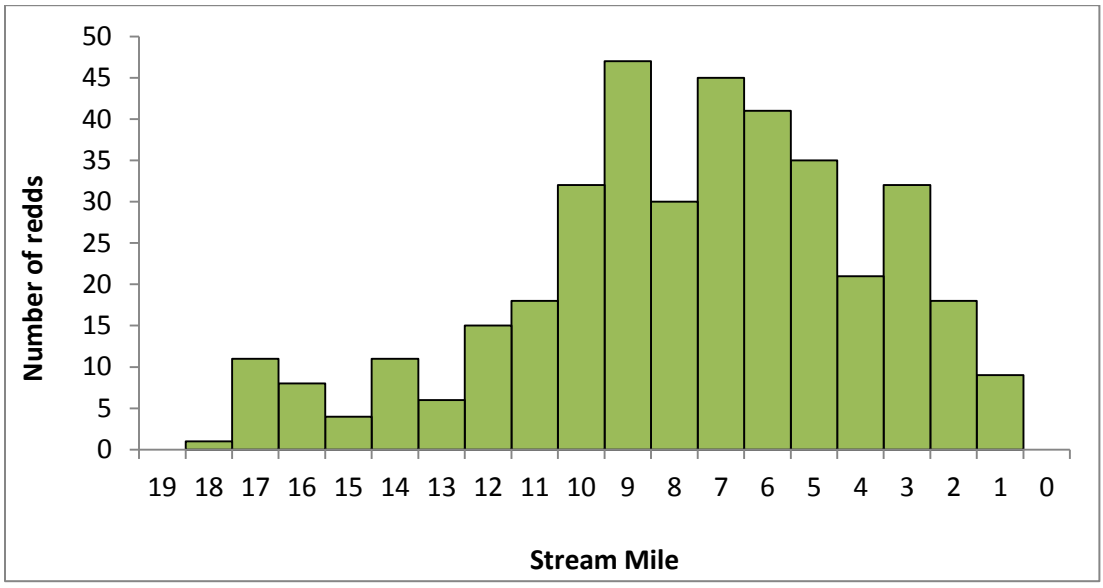

Figure 12. Redd distribution by stream mile in Cottonwood Creek during fall 2012.

Creek Conditions

Average flow in the creek during the survey period was 94 cubic feet per second (CFS) (min 54 CFS, max 456 CFS) (http:// nwis.waterdata.usgs.gov/nwis). Average water temperature over the entire period at the site of the video weir (SM 1) was 15.3˚ Celsius (C) (min 10.9˚ C, max 19.8˚ C) (D. Killam, pers. comm). The flows during FCS migration were within the range observed over the last 10 years. High flows, which occurred late in the season, (max 23,100 CFS on 2 December 2012) resulted in surveys being cancelled, due to safety concerns (http:// nwis.waterdata.usgs.gov/nwis). Therefore, data were not collected for the entire expected period of FCS spawning in Cottonwood Creek.

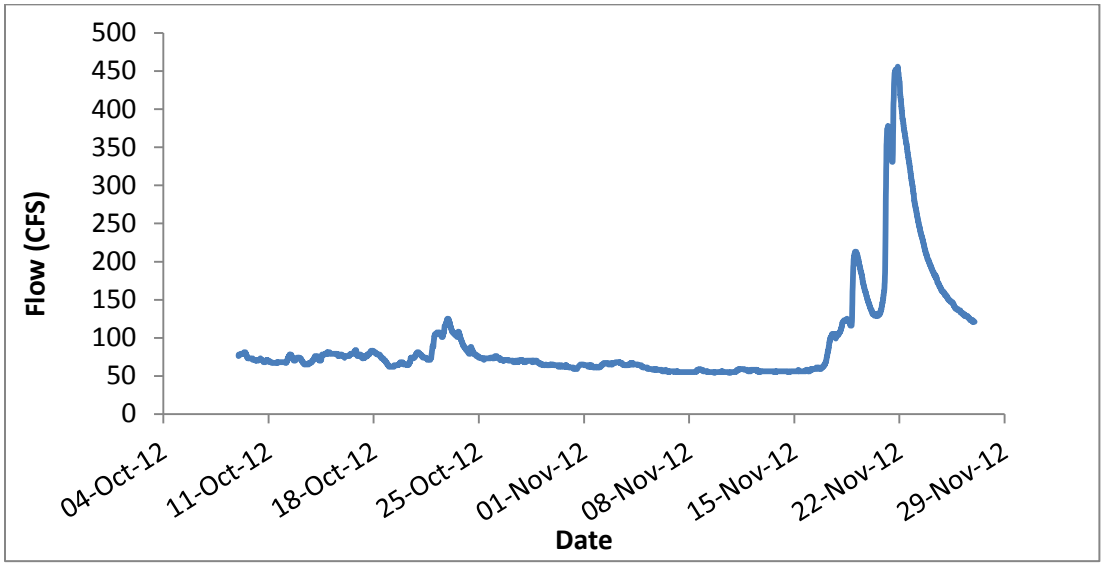

Figure 13. Flow in Cottonwood Creek from 9 October 2012 – 27 November 2012 at the Cottonwood Creek near Cottonwood, CA gage (USGS 11376000) located downstream of the I-5 bridge (SM 2).

Figure 14. Average daily water temperature at the CDFW Cottonwood Creek video weir site (SM 0) (D. Killam, pers. comm.).

Discussion

Central Valley FCS spawn in the lower elevations of the valley floor (Yoshiyama et al. 2001). Historical accounts indicate that a majority of FCS spawning within Cottonwood Creek occurred downstream of the confluence of the Middle and North Forks (SM 22; CH2MHill 2002). FCS have been observed spawning in the North Fork (CH2MHill 2002) and South Fork of Cottonwood Creek (Yoshiyama et al. 2001; CH2MHill 2002), but the spatial extent of current spawning is likely limited by instream flows and the availability of suitable habitats. Spawning of FCS in the South Fork of Cottonwood Creek was believed to be very limited in 2012, as that portion of the creek was dry for most of the survey season until a storm event increased flows during the week of 18 November 2012.

It is likely that FCS movements in Cottonwood Creek were affected by the presence of instream barriers (SM 7, SM 8, SM 11, SM 12 and SM 13). These barriers intermittently blocked or hindered upstream movements and therefore likely restricted the portion of the run able to migrate upstream of the survey area. For example, passage of FCS upstream of SM 12 in Cottonwood Creek was observed to be intermittently blocked by several beaver dams, including much of the early portion of the 2012 survey season. These barriers may be responsible for a higher percentage of the estimated run of FCS to Cottonwood Creek being recovered in 2012 (42%) as compared to 2011 (20%). Low water flows and shallow water depth at some riffles may have affected migration within the creek; however, the largest number of carcasses were recovered in similar portions of the creek in 2012 (SM 5- SM 10) and in 2011 (SM 6 - SM 11).

Additionally, more than twice the number of redds were counted in 2012 (N = 384) than in 2011 (N = 147), despite the Cottonwood Creek run size being only about 20% larger. It is expected that the total number of redds observed during the stream survey during the week of 4 November 2012 is an underestimate of the total produced during the entire spawning season. During redd construction, algae is scraped from gravel so that redds appear lighter in coloration compared to the surrounding stream bed. As redds age, algae growth reduces the ability of crews to identify redds that were created earlier in the spawning season. Additionally, some spawning likely occured after the last survey date. We believe, however, the data approximates the distribution and prevalence of FCS spawning within the surveyed area of Cottonwood Creek.

Expansions of CWT recoveries showed that approximately 25% of recovered carcasses on Cottonwood Creek in 2012 originated from Central Valley hatcheries, which is less than half that observed in 2011 (55% hatchery-origin). Hatchery-origin carcasses in 2012 were primarily age-3 adults, which is different from 2011 when coded-wire tag recoveries were predominately age-2. The male to female ratio in 2012 was nearly equal, regardless of origin, whereas the relatively strong age-2 class in 2011 (i.e., males) largely influenced the sex ratio, with 6 times as many hatchery-origin males as hatchery-origin females, but equal numbers in natural-origin salmon.

Approximately half of the hatchery-origin salmon in Cottonwood Creek were FCS from the Coleman NFH, and the rest were FCS from the Feather River Fish Hatchery. We caution the reader against interpreting the origins of hatchery salmon observed as the sole basis for comparing relative rates of straying from each hatchery facility. For example, the relatively higher proportion of Coleman NFH FCS recovered in Cottonwood Creek in 2012 should not be

interpreted as indicating a relatively higher rate of straying by salmon originating at Coleman NFH as compared to other Central Valley hatcheries. The proximal location of Cottonwood Creek to Coleman NFH likely contributes to the higher percentage of FCS originating from the Coleman NFH relative to other Central Valley hatcheries. Coleman NFH is located on Battle Creek, which flows into the Sacramento River only 2 miles downstream of the mouth of Cottonwood Creek. To compare the relative rates of straying between Central Valley hatchery facilities, it is important to consider the geographic scope of inference, and we recommend that straying for hatchery facilities be evaluated on the scale of the Central Valley Basin as described in Kormos et al. (2012).

Additionally, the greater number of Coleman NFH FCS onsite releases than offsite releases recovered in Cottonwood Creek should not be interpreted as indicating a relatively higher rate of straying by Coleman NFH salmon released onsite compared to salmon released offsite. These findings are supported by previous assessments of Coleman NFH off-site releases, which showed that juvenile salmon transported and released at distant locations were more likely to stray at geographically distant locations, whereas juvenile salmon released off-site but closer to the hatchery strayed at an intermediate level, and were recovered in closer proximity to the hatchery (Niemela 1996). When comparing the numbers of salmon recovered from Coleman NFH onsite and offsite releases relative to the total numbers released for each group, a higher proportion of offsite releases were recovered in Cottonwood Creek than onsite releases.

A comparison of the proportion of hatchery-origin salmon in Cottonwood Creek in 2012 using two different methods (i.e., carcass survey and video weir) yields slightly different results. The estimate of FCS escapement into Cottonwood Creek based on the video weir was 2,556. An estimated 5.6% of the FCS passing through the video weir was identified as missing an adipose fin (D. Killam, pers. comm.). Using the calculated average expansion factor based on CWT recoveries from the 2012 carcass survey (0.294), an estimated 19.0% or 487 salmon passing the video weir originated at hatcheries. In contrast, an estimated 6.9% of the salmon observed on the carcass survey were identified as missing an adipose fin. Based on actual CWT expansion factors from recovered carcasses and applied to the estimated escapement past the video weir, an estimated 25.0% or 639 salmon originated at hatcheries. In 2011, the carcass survey also estimated a higher proportion of hatchery-origin salmon in Cottonwood Creek (13.7% adipose fin-clips observed, expanded to 54.9% hatchery-origin) than the video weir (10.9% adipose fin-clips observed; expanded to 43.6% hatchery-origin).

Each method of estimating the proportion of hatchery-origin FCS in Cottonwood Creek has limitations and potential biases. In 2011, the principle bias of the carcass survey was likely related to our inability to obtain landowner permission to access some portions of the creek, which restricted the survey area to approximately 20 miles of Cottonwood Creek immediately upstream from the confluence with the Sacramento River. Therefore, some of the salmon that were counted at the video weir in 2011 would have been able to move upstream of the survey area. Some salmon also likely migrated above the area surveyed in 2012; however, beaver dams hindered or completely blocked migration upstream of SM 12 for most of the survey period, thereby likely reducing the proportion of the population above the survey area and contributing to a substantially higher rate of carcass recovery in 2012 (42%) as compared to 2011 (20%).

Carcass distribution showed a gradient in the proportion of hatchery-origin carcasses, with a higher proportion of hatchery-origin salmon observed closer to the confluence with the Sacramento River, and a lower proportion of hatchery-origin salmon in the uppermost survey reach. Some carcasses and redds were found near the upstream boundary of the survey, indicating that some spawning occurred upstream of the survey area. This, in combination with the observation of the gradient of the proportion of hatchery-origin salmon, suggests that the proportion of hatchery-origin salmon observed in the carcass survey was biased high and could explain the observed differences in clip rate between the video monitoring and the carcass survey. The 2012 results are consistent in this regard with observations from 2011.

Enumerating adipose fin-clip counts through video weirs can be confounded by turbidity and problems with video quality, which may limit the ability to distinguish adipose fin-clips with equal efficiency across entire escapement period. In 2012, however, water clarity was consistently good through much of the FCS run in Cottonwood Creek, with complications of observing adipose fin-clip status due to water clarity limited to approximately 2% of the migration season and no substantial problems with video quality (D. Killam, pers. comm.). In considering the potential biases of each method, we believe the video weir estimate of hatchery-origin salmon escapement into Cottonwood Creek is likely more accurate due to the consistency of video clarity and ability to observe all salmon that escaped into Cottonwood Creek.

Reach 1 was not consistently surveyed throughout the entire 2012 survey of Cottonwood Creek; however, it is unlikely that this substantially affected the results of the survey. Decisions to intermittently forego surveys of Reach 1 were made based either on the judgment that downstream beaver dams were impassable to FCS or because landowners would not provide the ability to access this reach of stream through their property during the final two weeks of the survey. We do not believe restrictions of landowner access to Reach 1 had a substantial effect on the total number of carcasses collected because less than 3% of all carcasses collected during 2012 on reaches 2 and 3 were collected during the final two survey periods. It is important to note that the 2012 survey of Cottonwood Creek was terminated two weeks earlier than in 2011 due to an extreme flow event that made conditions unsafe to kayak.

Information from the 2012 Cottonwood Creek carcass survey serves to capitalize on the substantial investments made into the Central Valley CFM program and partially fulfill the objectives of the Central Valley In-river Chinook Salmon Escapement Monitoring Plan for Cottonwood Creek. Additionally, information from the Cottonwood Creek carcass survey works toward achieving recommendations by the California Hatchery Scientific Review Group (HSRG) to monitor escapement of hatchery-origin salmon into natural spawning areas (California HSRG 2012). This survey supplements information from the video weir by providing tangible benefits, including the ability to collect biological samples and the ability to determine hatchery of origin and age structure for hatchery produced salmon. Differences observed between the two years of surveys highlight the importance of collecting multiple years of data to gain a greater understanding of annual variability. Collecting future escapement data from Cottonwood Creek, in addition to other tributaries of the upper Sacramento River, would further expand our understanding of how FCS spawn in the Central Valley, and can be used to promote better management of hatchery- and natural-origin stocks (California HSRG 2012).

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Appendix I

Table A.1. Release information associated with coded wire tags recovered from Chinook salmon carcasses in Cottonwood Creek during fall 2012. Numbers of juvenile salmon released are categorized based on juvenile CWT retention data as follows: Clip/Tag = adipose fin-clipped with CWT; No Clip/Tag = no adipose fin-clip with CWT; Clip/ No Tag = adipose fin-clipped without CWT; No Clip/ No Tag = no adipose fin-clip without CWT.

CWT Code	Hatchery of Origin	Run	Brood Year	Release Location	Clip/ Tag	No Clip/ Tag	Clip/ No Tag	No Clip/ No Tag	Expansion Factor	Number Recovered	Expanded Number
055183	Coleman NFH	Fall	2009	Coleman NFH	116291	282	0	349904	0.249	1	4.01
055189	Coleman NFH	Fall	2009	Coleman NFH	112440	0	0	337542	0.250	2	8.00
055191	Coleman NFH	Fall	2009	Coleman NFH	104281	0	0	313051	0.250	1	4.00
055193	Coleman NFH	Fall	2009	Coleman NFH	117720	0	0	353357	0.250	1	4.00
055194	Coleman NFH	Fall	2009	Coleman NFH	111590	0	0	336094	0.249	1	4.01
055198	Coleman NFH	Fall	2009	Coleman NFH	103920	0	0	311941	0.250	1	4.00
055199	Coleman NFH	Fall	2009	Coleman NFH	99659	0	0	300079	0.249	1	4.01
055221	Coleman NFH	Fall	2009	Coleman NFH	109482	0	550	330261	0.249	1	4.02
055222	Coleman NFH	Fall	2009	Coleman NFH	110067	0	788	332792	0.248	1	4.03
055223	Coleman NFH	Fall	2009	Coleman NFH	101711	0	0	305381	0.250	1	4.00
055224	Coleman NFH	Fall	2009	Coleman NFH	94403	0	243	285087	0.249	1	4.02
055225	Coleman NFH	Fall	2009	Coleman NFH	90698	0	0	272183	0.250	1	4.00
055184	Coleman NFH	Fall	2009	Mare Island Net pen	114091	0	0	347008	0.247	2	8.08
055187	Coleman NFH	Fall	2009	Mare Island Net pen	118588	0	309	356835	0.249	4	16.05
055196	Coleman NFH	Fall	2009	Mare Island Net pen	105240	0	0	316941	0.249	5	20.06
055382	Coleman NFH	Fall	2010	Coleman NFH	102858	481	0	311437	0.248	1	4.03
055384	Coleman NFH	Fall	2010	Coleman NFH	119435	0	0	358570	0.250	1	4.00
055385	Coleman NFH	Fall	2010	Coleman NFH	116099	0	0	348473	0.250	1	4.00
055386	Coleman NFH	Fall	2010	Coleman NFH	116363	0	0	349515	0.250	1	4.00
055392	Coleman NFH	Fall	2010	Coleman NFH	114286	0	0	343152	0.250	1	4.00
055396	Coleman NFH	Fall	2010	Coleman NFH	117642	0	0	353084	0.250	1	4.00
055378	Coleman NFH	Fall	2010	Mare Island	113686	0	0	341215	0.250	2	8.00
068668	Feather River Hatchery	Fall	2009	San Pablo Bay Net Pens	258683	654	991	782932	0.248	1	4.03
068670	Feather River Hatchery	Fall	2009	San Pablo Bay Net Pens	398016	494	494	1201929	0.249	1	4.02
068671	Feather River Hatchery	Fall	2009	San Pablo Bay Net Pens	392330	0	987	1181282	0.249	5	20.07
068672	Feather River Hatchery	Fall	2009	San Pablo Bay Net Pens	400675	0	981	1206374	0.249	12	48.16
068675	Feather River Hatchery	Fall	2009	Santa Cruz Harbor net pen	118879	2468	987	0	0.972	1	1.03

CWT Code	Hatchery of Origin	Run	Brood Year	Release Location	Clip/ Tag	No Clip/ Tag	Clip/ No Tag	No Clip/ No Tag	Expansion Factor	Number Recovered	Expanded Number
068624	Feather River Hatchery	Fall	2009	Tiburon	41238	212	211	212	0.985	4	4.06
068654	Feather River Hatchery	Fall	2009	Wickland Oil Net Pens	108744	0	3809	254	0.964	8	8.30
068695	Feather River Hatchery	Fall	2009	Wickland Oil Net Pens	89066	505	216	270205	0.247	2	8.08
068751	Feather River Hatchery	Fall	2010	Wickland Oil Net Pens	397697	0	2497	1208384	0.247	1	4.04
Lost									*0.294*	2	*10.2*
NTD									*0.294*	3	*6.8*
Total										72	247

Table A. 2. Biological data from Chinook salmon carcasses with a coded wire tag in Cottonwood Creek during fall 2012. "NTD" indicates there was no coded wire tag detected in the head, and "No Head" designates an adipose fin-clipped carcass for which no head was recovered, due to predation or deteriorated physical condition. Two coded wire tags were lost prior to decoding. A blank sample number indicates a tissue was not collected for the carcass, due to deteriorated physical condition.

Date	Sample	Sex	Fork Length	Adipose Fin Status	Spawn Status	Carcass Condition	Reach	Stream Mile	CWT Code
10/9/2012	1591	Male	830	Present	Unknown	Fresh	1	3	
10/16/2012	1704	Female	620	Present	Spawned	Fresh	2	7	
10/16/2012	1703	Male	820	Present	Unknown	Fresh	2	8	
10/16/2012	1702	Male	740	Unknown	Unknown	Very Non-Fresh	2	10	NTD
10/16/2012	1701	Male	890	Present	Unknown	Fresh	2	11	
10/17/2012	1710	Male	640	Present	Unknown	Fresh	3	0	
10/17/2012	1707	Male	900	Present	Unknown	Fresh	3	3	
10/17/2012	1708	Male	930	Present	Unknown	Fresh	3	3	
10/17/2012	1709	Male	680	Present	Unknown	Fresh	3	3	
10/17/2012	1706	Male	820	Present	Unknown	Fresh	3	4	
10/17/2012	1705	Female	690	Present	Spawned	Fresh	3	5	
10/23/2012	1614	Female	780	Absent	Spawned	fresh	3	0	055189
10/23/2012	1613	Male	570	Absent	Unknown	fresh	3	0	055392
10/23/2012	-	Male	650	Present	Unknown	non-fresh	3	0	
10/23/2012	1612	Male	950	Present	Unknown	fresh	3	0	
10/23/2012	1615	Male	580	Present	Unknown	fresh	3	0	
10/23/2012	1616	Male	850	Present	Unknown	fresh	3	0	
10/23/2012	1611	Female	840	Present	Spawned	fresh	3	1	
10/23/2012	1606	Female	720	Unknown	Unspawned	Non-Fresh	3	2	NTD
10/23/2012	1607	Male	930	Present	Unknown	fresh	3	2	
10/23/2012	1608	Female	710	Present	Unspawned	fresh	3	2	
10/23/2012	-	Male	850	Present	Unknown	non-fresh	3	2	
10/23/2012	-	Female	780	Present	Spawned	non-fresh	3	2	
10/23/2012	1609	Female	730	Present	Spawned	fresh	3	2	
10/23/2012	1610	Female	840	Present	Spawned	fresh	3	2	
10/23/2012	1600	Female	690	Absent	Spawned	fresh	3	3	055191
10/23/2012	1598	Female	820	Absent	Spawned	fresh	3	3	068671
10/23/2012	1599	Male	930	Present	Unknown	fresh	3	3	
10/23/2012	-	Male	920	Present	Unknown	non-fresh	3	3	
10/23/2012	1601	Male	890	Present	Unknown	fresh	3	3	
10/23/2012	1602	Female	830	Present	Spawned	fresh	3	3	
10/23/2012	1603	Female	800	Present	Spawned	Non-Fresh	3	3	
10/23/2012	1604	Female	740	Present	Spawned	fresh	3	3	
10/23/2012	1605	Female	740	Present	Spawned	fresh	3	3	
10/23/2012	-	Male	640	Present	Unknown	non-fresh	3	3	
10/23/2012	-	Male	950	Present	Unknown	non-fresh	3	3	
10/23/2012	-	Female	800	Present	Spawned	non-fresh	3	3	
10/23/2012	-	Male	850	Present	Unknown	non-fresh	3	3	
10/23/2012	-	Male	750	Present	Unknown	non-fresh	3	3	
10/23/2012	-	Female	820	Present	Spawned	non-fresh	3	3	
10/23/2012	1596	Female	730	Absent	Spawned	fresh	3	4	068624
10/23/2012	1595	Female	800	Present	Spawned	fresh	3	4	
10/23/2012	1597	Male	560	Present	Unknown	fresh	3	4	
10/23/2012	1593	Male	860	Absent	Unknown	Non-Fresh	3	5	055187
10/23/2012	1594	Male	540	Absent	Unknown	fresh	3	5	055382
10/23/2012	-	Male	830	Present	Unknown	non-fresh	3	5	
10/23/2012	1592	Female	810	Present	Spawned	fresh	3	5	
10/23/2012	-	Male	930	Present	Unknown	non-fresh	3	6	
10/24/2012	-	Female	700	Present	Spawned	non-fresh	2	6	
10/24/2012	1646	Male	610	Present	Unknown	fresh	2	6	
10/24/2012	-	Female	800	Present	Spawned	non-fresh	2	6	
10/24/2012	-	Male	870	Present	Unknown	non-fresh	2	6	
10/24/2012	-	Female	800	Present	Spawned	non-fresh	2	6	
10/24/2012	1644	Male	780	Absent	Unknown	Very Non-Fresh	2	7	055183
10/24/2012	-	Female	770	Present	Spawned	non-fresh	2	7	
10/24/2012	-	Female	720	Present	Spawned	non-fresh	2	7	
10/24/2012	1641	Female	820	Present	Spawned	fresh	2	7	
10/24/2012	-	Male	900	Present	Unknown	non-fresh	2	7	
10/24/2012	1640	Female	850	Present	Unspawned	fresh	2	7	
10/24/2012	-	Female	790	Present	Spawned	non-fresh	2	7	
10/24/2012	-	Female	820	Present	Spawned	non-fresh	2	7	
10/24/2012	-	Male	560	Present	Unknown	non-fresh	2	7	
10/24/2012	-	Male	880	Present	Unknown	very non-fresh	2	7	

Date	Sample	Sex	Fork Length	Adipose Fin Status	Spawn Status	Carcass Condition	Reach	Stream Mile	CWT Code
10/24/2012	-	Male	800	Present	Unknown	non-fresh	2	7	
10/24/2012	-	Male	850	Present	Unknown	non-fresh	2	7	
10/24/2012	-	Male	780	Present	Unknown	non-fresh	2	7	
10/24/2012	-	Male	880	Present	Unknown	non-fresh	2	7	
10/24/2012	1642	Male	900	Present	Unknown	fresh	2	7	
10/24/2012	1643	Female	750	Present	Spawned	fresh	2	7	
10/24/2012	-	Male	950	Present	Unknown	Very Non-Fresh	2	7	
10/24/2012	1645	Female	800	Present	Spawned	fresh	2	7	
10/24/2012	-	Male	1000	Present	Unknown	non-fresh	2	8	
10/24/2012	1637	Male	820	Present	Unknown	Fresh	2	8	
10/24/2012	-	Male	800	Present	Unknown	non-fresh	2	8	
10/24/2012	-	Female	790	Present	Spawned	very non-fresh	2	8	
10/24/2012	1638	Male	980	Present	Unknown	Fresh	2	8	
10/24/2012	-	Male	870	Present	Unknown	non-fresh	2	8	
10/24/2012	-	Female	790	Present	Spawned	non-fresh	2	8	
10/24/2012	1639	Male	860	Present	Unknown	fresh	2	8	
10/24/2012	1627	Male	860	Absent	Unknown	Fresh	2	9	068672
10/24/2012	1625	Male	860	Present	Unknown	Fresh	2	9	
10/24/2012	1626	Female	760	Present	Spawned	Fresh	2	9	
10/24/2012	-	Male	790	Present	Unknown	Non-Fresh	2	9	
10/24/2012	1628	Female	840	Present	Spawned	Fresh	2	9	
10/24/2012	1629	Male	920	Present	Unknown	Fresh	2	9	
10/24/2012	1630	Male	900	Present	Unknown	Fresh	2	9	
10/24/2012	1631	Male	900	Present	Unknown	Fresh	2	9	
10/24/2012	1632	Male	810	Present	Unknown	Fresh	2	9	
10/24/2012	-	Female	840	Present	Spawned	non-fresh	2	9	
10/24/2012	-	Female	800	Present	Spawned	non-fresh	2	9	
10/24/2012	1633	Female	860	Present	Spawned	fresh	2	9	
10/24/2012	1634	Female	780	Present	Spawned	Fresh	2	9	
10/24/2012	1635	Male	620	Present	Unknown	Fresh	2	9	
10/24/2012	-	Female	790	Present	Spawned	very non-fresh	2	9	
10/24/2012	1636	Female	670	Present	Spawned	Fresh	2	9	
10/24/2012	-	Female	740	Present	Spawned	very non-fresh	2	9	
10/24/2012	-	Male	850	Present	Unknown	Non-Fresh	2	9	
10/24/2012	-	Female	720	Present	Spawned	non-fresh	2	9	
10/24/2012	1620	Male	570	Absent	Unknown	Fresh	2	10	068751
10/24/2012	1621	Male	800	Present	Unknown	Fresh	2	10	
10/24/2012	-	Male	870	Present	Unknown	Very Non-Fresh	2	10	
10/24/2012	1622	Female	750	Present	Spawned	Fresh	2	10	
10/24/2012	-	Female	780	Present	Spawned	Non-Fresh	2	10	
10/24/2012	1623	Male	760	Present	Unknown	Fresh	2	10	
10/24/2012	1624	Male	880	Present	Unknown	Fresh	2	10	
10/24/2012	-	Male	870	Present	Unknown	Non-Fresh	2	10	
10/24/2012	-	Male	900	Present	Unknown	non-fresh	1	10	
10/24/2012	1617	Female	590	Present	Spawned	Fresh	2	11	
10/24/2012	1618	Male	820	Present	Unknown	Fresh	2	11	
10/24/2012	1619	Female	730	Present	Spawned	Fresh	2	11	
10/30/2012	1777	Male	720	Absent	Unknown	very non-fresh	3	0	055223
10/30/2012	-	Female	650	Present	Spawned	Non-fresh	3	0	
10/30/2012	1776	Male	830	Present	Unknown	Fresh	3	0	
10/30/2012	-	Male	690	Present	Unknown	Non-fresh	3	0	
10/30/2012	-	Male	860	Present	Unknown	Non-Fresh	3	0	
10/30/2012	-	Female	650	Present	Spawned	Non-fresh	3	0	
10/30/2012	-	Male	850	Present	Unknown	very non-fresh	3	0	
10/30/2012	-	Male	820	Present	Unknown	very non-fresh	3	0	
10/30/2012	-	Male	690	Present	Unknown	very non-fresh	3	0	
10/30/2012	-	Male	900	Present	Unknown	Non-fresh	3	0	
10/30/2012	1774	Male	730	Absent	Unknown	Very Non-Fresh	3	1	Lost
10/30/2012	-	Female	720	Present	Unspawned	Non-fresh	3	1	
10/30/2012	1775	Male	570	Present	Unknown	Fresh	3	1	
10/30/2012	-	Female	720	Present	Spawned	Non-fresh	3	1	
10/30/2012	-	Male	870	Present	Unknown	Non-fresh	3	1	
10/30/2012	1772	Male	840	Absent	Unknown	very non-fresh	3	2	055187
10/30/2012	1679	Male	820	Absent	Unknown	very non-fresh	3	2	055222
10/30/2012	1773	Male	850	Absent	Unknown	Non-fresh	3	2	068624
10/30/2012	1680	Female	740	Unknown	Spawned	Non-fresh	3	2	068671
10/30/2012	-	Female	740	Present	Spawned	very non-fresh	3	2	
10/30/2012	-	Female	820	Present	Spawned	Non-fresh	3	2	
10/30/2012	-	Female	770	Present	Spawned	Non-fresh	3	2	
10/30/2012	-	Male	750	Present	Unknown	very non-fresh	3	2	
10/30/2012	-	Male	850	Present	Unknown	Non-Fresh	3	2	
10/30/2012	1771	Female	840	Present	Spawned	Fresh	3	2	

Date	Sample	Sex	Fork Length	Adipose Fin Status	Spawn Status	Carcass Condition	Reach	Stream Mile	CWT Code
10/30/2012	-	Male	790	Present	Unknown	Non-fresh	3	2	
10/30/2012	-	Male	750	Present	Unknown	very non-fresh	3	2	
10/30/2012	-	Female	820	Present	Spawned	very non-fresh	3	2	
10/30/2012	-	Female	770	Present	Spawned	Non-fresh	3	3	
10/30/2012	-	Female	880	Present	Spawned	very non-fresh	3	3	
10/30/2012	1675	Male	760	Present	Unknown	Fresh	3	3	
10/30/2012	-	Female	740	Present	Spawned	Non-fresh	3	3	
10/30/2012	-	Male	590	Present	Unknown	Non-fresh	3	3	
10/30/2012	1676	Male	900	Present	Unknown	Fresh	3	3	
10/30/2012	1677	Female	750	Present	Spawned	Fresh	3	3	
10/30/2012	-	Female	760	Present	Spawned	Non-fresh	3	3	
10/30/2012	-	Male	720	Present	Unknown	very non-fresh	3	3	
10/30/2012	1678	Female	780	Present	Spawned	Fresh	3	3	
10/30/2012	-	Male	800	Present	Unknown	Non-fresh	3	3	
10/30/2012	-	Female	730	Present	Spawned	very non-fresh	3	3	
10/30/2012	-	Male	760	Present	Unknown	Non-fresh	3	3	
10/30/2012	-	Female	830	Present	Spawned	Non-fresh	3	3	
10/30/2012	-	Male	870	Present	Unknown	very non-fresh	3	3	
10/30/2012	-	Female	810	Present	Spawned	very non-fresh	3	3	
10/30/2012	-	Female	740	Present	Spawned	very non-fresh	3	3	
10/30/2012	-	Female	810	Present	Spawned	Non-Fresh	3	3	
10/30/2012	1673	Female	810	Present	Spawned	Fresh	3	4	
10/30/2012	-	Female	910	Present	Spawned	Non-fresh	3	4	
10/30/2012	-	Male	880	Present	Unknown	very non-fresh	3	4	
10/30/2012	-	Female	870	Present	Spawned	Non-fresh	3	4	
10/30/2012	-	Female	710	Present	Spawned	Non-fresh	3	4	
10/30/2012	1674	Female	830	Present	Unspawned	Fresh	3	4	
10/30/2012	-	Female	810	Present	Spawned	very non-fresh	3	4	
10/30/2012	-	Male	850	Present	Unknown	very non-fresh	3	4	
10/30/2012	-	Male	870	Present	Unknown	Non-fresh	3	4	
10/30/2012	-	Female	770	Present	Spawned	Non-fresh	3	4	
10/30/2012	-	Female	780	Present	Spawned	Non-fresh	3	4	
10/30/2012	-	Female	760	Present	Spawned	Non-fresh	3	4	
10/30/2012	-	Female	730	Present	Spawned	Non-fresh	3	4	
10/30/2012	-	Female	830	Present	Spawned	Non-fresh	3	4	
10/30/2012	1671	Female	700	Absent	Spawned	Fresh	3	5	055184
10/30/2012	1669	Female	750	Absent	Spawned	Fresh	3	5	055196
10/30/2012	1658	Female	780	Absent	Spawned	Non-fresh	3	5	055225
10/30/2012	1663	Male	540	Absent	Unknown	Non-fresh	3	5	055378
10/30/2012	1660	Female	700	Absent	Spawned	very non-fresh	3	5	068654
10/30/2012	1662	Female	730	Absent	Spawned	very non-fresh	3	5	068654
10/30/2012	1667	Female	740	Absent	Spawned	Non-fresh	3	5	068671
10/30/2012	1661	Female	800	Absent	Spawned	Non-fresh	3	5	068672
10/30/2012	1664	Male	910	Present	Unknown	Fresh	3	5	
10/30/2012	-	Male	850	Present	Unknown	very non-fresh	3	5	
10/30/2012	1665	Female	660	Present	Spawned	Fresh	3	5	
10/30/2012	1666	Female	720	Present	Spawned	Fresh	3	5	
10/30/2012	-	Male	910	Present	Unknown	very non-fresh	3	5	
10/30/2012	-	Female	740	Present	Spawned	Non-fresh	3	5	
10/30/2012	-	Female	800	Present	Spawned	Non-fresh	3	5	
10/30/2012	-	Male	860	Present	Unknown	Non-fresh	3	5	
10/30/2012	1668	Male	580	Present	Unknown	Fresh	3	5	
10/30/2012	-	Female	680	Present	Spawned	Non-fresh	3	5	
10/30/2012	1656	Female	660	Present	Spawned	Fresh	3	5	
10/30/2012	1657	Male	820	Present	Unknown	Fresh	3	5	
10/30/2012	-	Male	780	Present	Unknown	Non-fresh	3	5	
10/30/2012	-	Female	690	Present	Spawned	Non-fresh	3	5	
10/30/2012	1659	Male	560	Present	Unknown	Fresh	3	5	
10/30/2012	-	Female	750	Present	Spawned	very non-fresh	3	5	
10/30/2012	-	Female	700	Present	Spawned	very non-fresh	3	5	
10/30/2012	-	Female	790	Present	Spawned	very non-fresh	3	5	
10/30/2012	1670	Female	770	Present	Spawned	Fresh	3	5	
10/30/2012	-	Female	820	Present	Spawned	very non-fresh	3	5	
10/30/2012	-	Male	970	Present	Unknown	very non-fresh	3	5	
10/30/2012	1672	Male	900	Present	Unknown	Fresh	3	5	
10/30/2012	-	Male	760	Present	Unknown	Non-fresh	3	5	
10/30/2012	-	Male	780	Present	Unknown	Non-fresh	3	5	
10/30/2012	-	Female	800	Present	Spawned	Non-fresh	3	5	
10/30/2012	-	Female	650	Present	Spawned	very non-fresh	3	5	
10/30/2012	1649	Female	730	Absent	Spawned	very non-fresh	3	6	068624
10/30/2012	1650	Male	810	Absent	Unknown	Fresh	3	6	068672
10/30/2012	-	Male	810	Present	Unknown	very non-fresh	3	6	

Date	Sample	Sex	Fork Length	Adipose Fin Status	Spawn Status	Carcass Condition	Reach	Stream Mile	CWT Code
10/30/2012	-	Female	750	Present	Spawned	Non-fresh	3	6	
10/30/2012	1648	Female	820	Present	Spawned	Fresh	3	6	
10/30/2012	-	Male	570	Present	Unknown	Non-fresh	3	6	
10/30/2012	-	Male	890	Present	Unknown	Non-fresh	3	6	
10/30/2012	-	Female	780	Present	Spawned	very non-fresh	3	6	
10/30/2012	-	Female	720	Present	Spawned	very non-fresh	3	6	
10/30/2012	-	Male	670	Present	Unknown	Non-fresh	3	6	
10/30/2012	-	Female	800	Present	Spawned	Non-fresh	3	6	
10/30/2012	-	Female	850	Present	Spawned	Non-fresh	3	6	
10/30/2012	-	Female	730	Present	Spawned	Non-fresh	3	6	
10/30/2012	-	Female	690	Present	Spawned	Non-fresh	3	6	
10/30/2012	-	Female	860	Present	Spawned	very non-fresh	3	6	
10/30/2012	1647	Female	700	Present	Spawned	Fresh	3	6	
10/30/2012	-	Male	700	Present	Unknown	Non-fresh	3	6	
10/30/2012	-	Male	540	Present	Unknown	Non-fresh	3	6	
10/30/2012	-	Male	790	Present	Unknown	Non-fresh	3	6	
10/30/2012	-	Female	670	Present	Spawned	Non-fresh	3	6	
10/30/2012	-	Female	780	Present	Unspawned	Non-fresh	3	6	
10/30/2012	-	Male	810	Present	Unknown	very non-fresh	3	6	
10/30/2012	-	Female	780	Present	Spawned	very non-fresh	3	6	
10/30/2012	-	Male	660	Present	Unknown	Non-fresh	3	6	
10/30/2012	-	Male	600	Present	Unknown	very non-fresh	3	6	
10/30/2012	-	Male	700	Present	Unknown	very non-fresh	3	6	
10/30/2012	-	Female	870	Present	Spawned	Non-Fresh	3	6	
10/30/2012	-	Male	700	Present	Unknown	very non-fresh	3	6	
10/30/2012	-	Male	870	Present	Unknown	Non-fresh	3	6	
10/30/2012	-	Female	830	Present	Spawned	Non-fresh	3	6	
10/30/2012	-	Female	900	Present	Unspawned	Non-fresh	3	6	
10/30/2012	1651	Female	700	Present	Spawned	Fresh	3	6	
10/30/2012	1652	Female	740	Present	Spawned	Fresh	3	6	
10/30/2012	-	Female	730	Present	Spawned	Non-fresh	3	6	
10/30/2012	-	Male	920	Present	Unknown	Non-fresh	3	6	
10/30/2012	-	Female	790	Present	Spawned	Non-fresh	3	6	
10/30/2012	-	Male	520	Present	Unknown	Non-fresh	3	6	
10/30/2012	1653	Male	1010	Present	Unknown	Fresh	3	6	
10/30/2012	1654	Female	760	Present	Spawned	Fresh	3	6	
10/30/2012	1655	Female	730	Present	Spawned	Fresh	3	6	
10/31/2012	1905	Male	770	Absent	Unknown	Fresh	2.2	7	055193
10/31/2012	1907	Male	800	Unknown	Unknown	Non-fresh	2.2	7	068672
10/31/2012	-	Female	740	Present	Spawned	Non-fresh	2.2	7	
10/31/2012	-	Female	830	Present	Spawned	Non-fresh	2.2	7	
10/31/2012	-	Female	760	Present	Spawned	Non-fresh	2.2	7	
10/31/2012	-	Female	740	Present	Spawned	Non-fresh	2.2	7	
10/31/2012	-	Male	850	Present	Unknown	Non-fresh	2.2	7	
10/31/2012	-	Male	830	Present	Unknown	Non-fresh	2.2	7	
10/31/2012	-	Female	760	Present	Spawned	Non-fresh	2.2	7	
10/31/2012	-	Female	720	Present	Spawned	Non-fresh	2.2	7	
10/31/2012	-	Female	760	Present	Spawned	Non-fresh	2.2	7	
10/31/2012	-	Female	720	Present	Spawned	Non-fresh	2.2	7	
10/31/2012	-	Female	740	Present	Spawned	Non-fresh	2.2	7	
10/31/2012	-	Male	580	Present	Unknown	Non-fresh	2.2	7	
10/31/2012	-	Male	560	Present	Unknown	Non-fresh	2.2	7	
10/31/2012	1902	Female	790	Present	Spawned	Fresh	2.2	7	
10/31/2012	1910	Female	800	Present	Spawned	Fresh	2.2	7	
10/31/2012	-	Male	740	Present	Unknown	Non-fresh	2.2	7	
10/31/2012	1911	Male	850	Present	Unknown	Fresh	2.2	7	
10/31/2012	1912	Female	760	Present	Spawned	Fresh	2.2	7	
10/31/2012	-	Male	870	Present	Unknown	Non-fresh	2.2	7	
10/31/2012	1913	Female	780	Present	Spawned	Fresh	2.2	7	
10/31/2012	-	Female	880	Present	Spawned	Non-fresh	2.2	7	
10/31/2012	-	Male	900	Present	Unknown	Non-fresh	2.2	7	
10/31/2012	-	Male	760	Present	Unknown	Non-fresh	2.2	7	
10/31/2012	1903	Male	560	Present	Unknown	Fresh	2.2	7	
10/31/2012	-	Male	550	Present	Unknown	Non-fresh	2.2	7	
10/31/2012	-	Male	890	Present	Unknown	Non-fresh	2.2	7	
10/31/2012	-	Male	880	Present	Unknown	Non-fresh	2.2	7	
10/31/2012	-	Female	750	Present	Spawned	Non-fresh	2.2	7	
10/31/2012	-	Female	790	Present	Spawned	Non-fresh	2.2	7	
10/31/2012	1904	Female	790	Present	Spawned	Fresh	2.2	7	
10/31/2012	-	Female	790	Present	Spawned	Non-fresh	2.2	7	
10/31/2012	1906	Male	810	Present	Unknown	Fresh	2.2	7	
10/31/2012	-	Male	790	Present	Unknown	Non-fresh	2.2	7	

Date	Sample	Sex	Fork Length	Adipose Fin Status	Spawn Status	Carcass Condition	Reach	Stream Mile	CWT Code
10/31/2012	-	Male	820	Present	Unknown	Non-fresh	2.2	7	
10/31/2012	-	Female	780	Present	Spawned	Non-fresh	2.2	7	
10/31/2012	-	Female	760	Present	Spawned	Non-fresh	2.2	7	
10/31/2012	-	Male	820	Present	Unknown	Non-fresh	2.2	7	
10/31/2012	-	Male	780	Present	Unknown	Non-fresh	2.2	7	
10/31/2012	-	Male	590	Present	Unknown	Non-fresh	2.2	7	
10/31/2012	-	Male	570	Present	Unknown	Non-fresh	2.2	7	
10/31/2012	1909	Male	620	Present	Unknown	Fresh	2.2	7	
10/31/2012	1908	Male	860	Present	Unknown	Fresh	2.2	7	
10/31/2012	-	Male	570	Present	Unknown	Non-fresh	2.2	7	
10/31/2012	-	Male	630	Present	Unknown	Non-fresh	2.2	7	
10/31/2012	-	Male	780	Present	Unknown	Non-fresh	2.2	7	
10/31/2012	-	Male	840	Present	Unknown	Non-Fresh	2.2	7	
10/31/2012	-	Male	850	Present	Unknown	Non-fresh	2.2	7	
10/31/2012	-	Female	760	Present	Spawned	Non-fresh	2.2	7	
10/31/2012	-	Male	850	Present	Unknown	Non-fresh	2.2	7	
10/31/2012	1914	Male	560	Present	Unknown	Fresh	2.2	7	
10/31/2012	-	Female	730	Present	Spawned	Non-fresh	2.2	7	
10/31/2012	-	Female	790	Present	Spawned	Non-fresh	2.2	7	
10/31/2012	-	Male	690	Present	Unknown	Non-fresh	2.2	7	
10/31/2012	-	Female	820	Present	Spawned	Non-fresh	2.2	7	
10/31/2012	-	Male	850	Present	Unknown	Non-fresh	2.2	7	
10/31/2012	1915	Male	550	Present	Unknown	Fresh	2.2	7	
10/31/2012	-	Female	720	Present	Spawned	Non-fresh	2.2	7	
10/31/2012	-	Female	870	Present	Spawned	Non-fresh	2.2	7	
10/31/2012	-	Male	900	Present	Unknown	Non-fresh	2.2	7	
10/31/2012	-	Female	800	Present	Spawned	Non-fresh	2.2	7	
10/31/2012	-	Female	890	Present	Spawned	Non-fresh	2.2	7	
10/31/2012	-	Male	890	Present	Unknown	Non-fresh	2.2	7	
10/31/2012	-	Male	650	Present	Unknown	Non-fresh	2.2	7	
10/31/2012	-	Female	820	Present	Spawned	Non-fresh	2.2	7	
10/31/2012	1897	Male	850	Absent	Unknown	Non-fresh	2.2	8	055196
10/31/2012	1892	Male	840	Absent	Unknown	Non-fresh	2.2	8	055224
10/31/2012	1901	Female	810	Absent	Spawned	Non-fresh	2.2	8	068672
10/31/2012	1893	Female	780	Absent	Spawned	Non-Fresh	2.2	8	068695
10/31/2012	-	Male	880	Present	Unknown	Non-fresh	2.2	8	
10/31/2012	-	Female	780	Present	Spawned	Non-fresh	2.2	8	
10/31/2012	-	Male	880	Present	Unknown	Non-fresh	2.2	8	
10/31/2012	1891	Female	800	Present	Spawned	Fresh	2.2	8	
10/31/2012	-	Female	810	Present	Spawned	Non-Fresh	2.2	8	
10/31/2012	-	Male	750	Present	Unknown	Non-fresh	2.2	8	
10/31/2012	-	Female	800	Present	Spawned	Non-fresh	2.2	8	
10/31/2012	-	Male	580	Present	Unknown	Non-fresh	2.2	8	
10/31/2012	-	Male	580	Present	Unknown	Non-fresh	2.2	8	
10/31/2012	1894	Female	860	Present	Spawned	Fresh	2.2	8	
10/31/2012	-	Male	900	Present	Unknown	Non-Fresh	2.2	8	
10/31/2012	-	Male	720	Present	Unknown	Non-fresh	2.2	8	
10/31/2012	-	Female	800	Present	Spawned	Non-fresh	2.2	8	
10/31/2012	-	Male	900	Present	Unknown	Non-fresh	2.2	8	
10/31/2012	-	Male	870	Present	Unknown	Non-fresh	2.2	8	
10/31/2012	1895	Female	790	Present	Spawned	Fresh	2.2	8	
10/31/2012	1896	Female	760	Present	Spawned	Fresh	2.2	8	
10/31/2012	-	Male	860	Present	Unknown	Non-fresh	2.2	8	
10/31/2012	-	Male	570	Present	Unknown	Non-fresh	2.2	8	
10/31/2012	-	Female	740	Present	Spawned	Non-Fresh	2.2	8	
10/31/2012	-	Male	960	Present	Unknown	Non-fresh	2.2	8	
10/31/2012	-	Male	820	Present	Unknown	Non-fresh	2.2	8	
10/31/2012	-	Male	590	Present	Unknown	Non-fresh	2.2	8	
10/31/2012	-	Male	860	Present	Unknown	Non-fresh	2.2	8	
10/31/2012	1898	Female	720	Present	Spawned	Fresh	2.2	8	
10/31/2012	-	Male	890	Present	Unknown	Non-fresh	2.2	8	
10/31/2012	1899	Female	750	Present	Spawned	Fresh	2.2	8	
10/31/2012	1900	Male	850	Present	Unknown	Fresh	2.2	8	
10/31/2012	-	Male	600	Present	Unknown	Non-fresh	2.2	8	
10/31/2012	-	Male	870	Present	Unknown	Non-fresh	2.2	8	
10/31/2012	-	Male	950	Present	Unknown	Non-fresh	2.2	8	
10/31/2012	1886	Female	770	Absent	Spawned	Non-fresh	2.2	9	055187
10/31/2012	1890	Female	820	Absent	Spawned	Non-fresh	2.2	9	055187
10/31/2012	1862	Female	850	Absent	Spawned	Fresh	2.2	9	068670
10/31/2012	1880	Male	610	Unknown	Unknown	Non-fresh	2.2	9	NTD
10/31/2012	1881	Female	800	Unknown	Spawned	Non-fresh	2.2	9	NTD
10/31/2012	-	Female	780	Present	Spawned	Non-fresh	2.2	9	

Date	Sample	Sex	Fork Length	Adipose Fin Status	Spawn Status	Carcass Condition	Reach	Stream Mile	CWT Code
10/31/2012	1885	Female	870	Present	Spawned	Fresh	2.2	9	
10/31/2012	-	Male	800	Present	Unknown	Non-fresh	2.2	9	
10/31/2012	-	Male	620	Present	Unknown	Non-fresh	2.2	9	
10/31/2012	1887	Male	900	Present	Unknown	Fresh	2.2	9	
10/31/2012	-	Female	790	Present	Spawned	Non-fresh	2.2	9	
10/31/2012	-	Female	840	Present	Spawned	Non-fresh	2.2	9	
10/31/2012	-	Female	760	Present	Spawned	Non-fresh	2.2	9	
10/31/2012	1888	Female	740	Present	Spawned	Fresh	2.2	9	
10/31/2012	-	Female	790	Present	Spawned	Non-fresh	2.2	9	
10/31/2012	-	Female	800	Present	Spawned	Non-fresh	2.2	9	
10/31/2012	-	Female	780	Present	Spawned	Non-fresh	2.2	9	
10/31/2012	-	Male	840	Present	Unknown	Non-fresh	2.2	9	
10/31/2012	1861	Male	610	Present	Unknown	Fresh	2.2	9	
10/31/2012	-	Male	870	Present	Unknown	Non-fresh	2.2	9	
10/31/2012	1863	Female	750	Present	Spawned	Fresh	2.2	9	
10/31/2012	-	Female	780	Present	Spawned	Non-fresh	2.2	9	
10/31/2012	-	Male	520	Present	Unknown	Non-fresh	2.2	9	
10/31/2012	1864	Male	690	Present	Unknown	Fresh	2.2	9	
10/31/2012	1865	Female	880	Present	Spawned	Fresh	2.2	9	
10/31/2012	1866	Male	760	Present	Unknown	Fresh	2.2	9	
10/31/2012	1867	Male	590	Present	Unknown	Fresh	2.2	9	
10/31/2012	1868	Female	840	Present	Spawned	Fresh	2.2	9	
10/31/2012	1869	Female	720	Present	Spawned	Fresh	2.2	9	
10/31/2012	-	Male	840	Present	Unknown	Non-fresh	2.2	9	
10/31/2012	-	Female	750	Present	Spawned	Non-fresh	2.2	9	
10/31/2012	-	Female	840	Present	Spawned	Non-fresh	2.2	9	
10/31/2012	1870	Male	910	Present	Unknown	Fresh	2.2	9	
10/31/2012	1871	Male	730	Present	Unknown	Fresh	2.2	9	
10/31/2012	1872	Female	750	Present	Spawned	Fresh	2.2	9	
10/31/2012	1873	Female	830	Present	Spawned	Fresh	2.2	9	
10/31/2012	-	Male	820	Present	Unknown	Non-fresh	2.2	9	
10/31/2012	-	Male	600	Present	Unknown	Non-fresh	2.2	9	
10/31/2012	1874	Female	740	Present	Spawned	Fresh	2.2	9	
10/31/2012	1875	Female	750	Present	Spawned	Fresh	2.2	9	
10/31/2012	-	Male	840	Present	Unknown	Non-fresh	2.2	9	
10/31/2012	-	Male	760	Present	Unknown	Non-fresh	2.2	9	
10/31/2012	-	Male	820	Present	Unknown	Non-fresh	2.2	9	
10/31/2012	-	Male	640	Present	Unknown	Non-fresh	2.2	9	
10/31/2012	-	Male	750	Present	Unknown	Non-fresh	2.2	9	
10/31/2012	1876	Male	840	Present	Unknown	Fresh	2.2	9	
10/31/2012	-	Male	850	Present	Unknown	Non-fresh	2.2	9	
10/31/2012	-	Female	760	Present	Spawned	Non-fresh	2.2	9	
10/31/2012	-	Male	880	Present	Unknown	Non-fresh	2.2	9	
10/31/2012	-	Male	860	Present	Unknown	Non-fresh	2.2	9	
10/31/2012	-	Female	730	Present	Spawned	Non-fresh	2.2	9	
10/31/2012	-	Female	760	Present	Spawned	Non-fresh	2.2	9	
10/31/2012	-	Male	850	Present	Unknown	Non-fresh	2.2	9	
10/31/2012	1877	Female	790	Present	Spawned	Fresh	2.2	9	
10/31/2012	-	Male	730	Present	Unknown	Non-fresh	2.2	9	
10/31/2012	-	Female	780	Present	Spawned	Non-fresh	2.2	9	
10/31/2012	-	Female	840	Present	Spawned	Non-fresh	2.2	9	
10/31/2012	-	Female	760	Present	Spawned	Non-fresh	2.2	9	
10/31/2012	-	Female	720	Present	Spawned	Non-Fresh	2.2	9	
10/31/2012	-	Female	790	Present	Spawned	Non-fresh	2.2	9	
10/31/2012	-	Male	820	Present	Unknown	Non-fresh	2.2	9	
10/31/2012	-	Female	770	Present	Spawned	Non-fresh	2.2	9	
10/31/2012	-	Male	860	Present	Unknown	Non-fresh	2.2	9	
10/31/2012	-	Male	810	Present	Unknown	Non-fresh	2.2	9	
10/31/2012	1878	Female	830	Present	Spawned	Fresh	2.2	9	
10/31/2012	1879	Male	920	Present	Unknown	Fresh	2.2	9	
10/31/2012	-	Female	720	Present	Spawned	Non-fresh	2.2	9	
10/31/2012	-	Male	850	Present	Unknown	Non-fresh	2.2	9	
10/31/2012	-	Male	780	Present	Unknown	Non-fresh	2.2	9	
10/31/2012	1882	Female	760	Present	Spawned	Fresh	2.2	9	
10/31/2012	-	Male	620	Present	Unknown	Non-fresh	2.2	9	
10/31/2012	-	Female	760	Present	Spawned	Non-fresh	2.2	9	
10/31/2012	-	Male	740	Present	Unknown	Non-fresh	2.2	9	
10/31/2012	1883	Female	750	Present	Spawned	Fresh	2.2	9	
10/31/2012	-	Male	620	Present	Unknown	Non-fresh	2.2	9	
10/31/2012	-	Male	610	Present	Unknown	Non-fresh	2.2	9	
10/31/2012	-	Male	950	Present	Unknown	Non-fresh	2.2	9	
10/31/2012	-	Male	880	Present	Unknown	Non-fresh	2.2	9	

Date	Sample	Sex	Fork Length	Adipose Fin Status	Spawn Status	Carcass Condition	Reach	Stream Mile	CWT Code
10/31/2012	-	Male	600	Present	Unknown	Non-fresh	2.2	9	
10/31/2012	-	Male	710	Present	Unknown	Non-fresh	2.2	9	
10/31/2012	-	Male	870	Present	Unknown	Non-fresh	2.2	9	
10/31/2012	-	Male	790	Present	Unknown	Non-fresh	2.2	9	
10/31/2012	-	Male	580	Present	Unknown	Non-fresh	2.2	9	
10/31/2012	1884	Male	670	Present	Unknown	Fresh	2.2	9	
10/31/2012	1889	Female	740	Present	Spawned	Fresh	2.2	9	
10/31/2012	-	Female	860	Present	Unspawned	Non-fresh	2.2	9	
10/31/2012	1801	Male	830	Absent	Unknown	Fresh	2.1	10	055184
10/31/2012	1803	Male	780	Absent	Unknown	Fresh	2.1	10	055221
10/31/2012	1805	Female	780	Absent	Spawned	very non-fresh	2.1	10	NTD
10/31/2012	1794	Male	600	Present	Unknown	Fresh	2.1	10	
10/31/2012	-	Male	870	Present	Unknown	Non-fresh	2.1	10	
10/31/2012	-	Male	600	Present	Unknown	Non-fresh	2.1	10	
10/31/2012	-	Female	830	Present	Spawned	Non-Fresh	2.1	10	
10/31/2012	-	Male	520	Present	Unknown	Non-fresh	2.1	10	
10/31/2012	-	Male	880	Present	Unknown	Non-fresh	2.1	10	
10/31/2012	-	Male	870	Present	Unknown	Non-fresh	2.1	10	
10/31/2012	-	Male	840	Present	Unknown	Non-fresh	2.1	10	
10/31/2012	-	Male	820	Present	Unknown	Non-fresh	2.1	10	
10/31/2012	-	Male	800	Present	Unknown	Non-fresh	2.1	10	
10/31/2012	1793	Female	720	Present	Spawned	Fresh	2.1	10	
10/31/2012	-	Male	840	Present	Unknown	Non-fresh	2.1	10	
10/31/2012	-	Female	800	Present	Spawned	Non-fresh	2.1	10	
10/31/2012	-	Female	700	Present	Spawned	Non-fresh	2.1	10	
10/31/2012	1795	Female	760	Present	Spawned	Fresh	2.1	10	
10/31/2012	1796	Female	790	Present	Spawned	Fresh	2.1	10	
10/31/2012	-	Female	630	Present	Spawned	Non-fresh	2.1	10	
10/31/2012	-	Female	840	Present	Spawned	Non-fresh	2.1	10	
10/31/2012	-	Female	620	Present	Spawned	Very Non-Fresh	2.1	10	
10/31/2012	-	Male	790	Present	Unknown	very non-fresh	2.1	10	
10/31/2012	-	Male	810	Present	Unknown	very non-fresh	2.1	10	
10/31/2012	-	Female	740	Present	Spawned	Non-fresh	2.1	10	
10/31/2012	-	Female	770	Present	Spawned	Non-fresh	2.1	10	
10/31/2012	-	Female	770	Present	Spawned	Non-fresh	2.1	10	
10/31/2012	-	Male	870	Present	Unknown	Non-fresh	2.1	10	
10/31/2012	-	Female	780	Present	Spawned	Non-fresh	2.1	10	
10/31/2012	-	Male	600	Present	Unknown	Non-fresh	2.1	10	
10/31/2012	1797	Female	720	Present	Spawned	Fresh	2.1	10	
10/31/2012	1798	Male	840	Present	Unknown	Fresh	2.1	10	
10/31/2012	-	Female	760	Present	Spawned	Non-fresh	2.1	10	
10/31/2012	-	Female	820	Present	Spawned	Non-fresh	2.1	10	
10/31/2012	-	Female	830	Present	Spawned	Non-fresh	2.1	10	
10/31/2012	1799	Female	720	Present	Spawned	Fresh	2.1	10	
10/31/2012	1800	Male	810	Present	Unknown	Fresh	2.1	10	
10/31/2012	-	Female	740	Present	Spawned	Very Non-Fresh	2.1	10	
10/31/2012	-	Female	710	Present	Spawned	Very Non-Fresh	2.1	10	
10/31/2012	-	Male	620	Present	Unknown	Non-fresh	2.1	10	
10/31/2012	1802	Male	790	Present	Unknown	Fresh	2.1	10	
10/31/2012	-	Female	720	Present	Spawned	Non-fresh	2.1	10	
10/31/2012	-	Male	890	Present	Unknown	Non-fresh	2.1	10	
10/31/2012	-	Female	790	Present	Spawned	Non-fresh	2.1	10	
10/31/2012	-	Male	730	Present	Unknown	very non-fresh	2.1	10	
10/31/2012	-	Male	940	Present	Unknown	Non-fresh	2.1	10	
10/31/2012	-	Male	840	Present	Unknown	Non-fresh	2.1	10	
10/31/2012	-	Male	790	Present	Unknown	Non-fresh	2.1	10	
10/31/2012	-	Male	630	Present	Unknown	Non-fresh	2.1	10	
10/31/2012	1804	Female	740	Present	Spawned	Fresh	2.1	10	
10/31/2012	-	Female	930	Present	Spawned	Non-fresh	2.1	10	
10/31/2012	-	Female	700	Present	Spawned	Non-fresh	2.1	10	
10/31/2012	-	Female	700	Present	Spawned	very non-fresh	2.1	10	
10/31/2012	1806	Female	850	Present	Spawned	Fresh	2.1	10	
10/31/2012	-	Male	500	Present	Unknown	very non-fresh	2.1	10	
10/31/2012	-	Female	760	Present	Spawned	Non-fresh	2.1	10	
10/31/2012	-	Female	770	Present	Spawned	Non-fresh	2.1	10	
10/31/2012	1790	Male	900	Absent	Unknown	Non-fresh	2.1	11	055189
10/31/2012	1788	Male	850	Present	Unknown	Fresh	2.1	11	
10/31/2012	-	Male	730	Present	Unknown	very non-fresh	2.1	11	
10/31/2012	1789	Male	600	Present	Unknown	Fresh	2.1	11	
10/31/2012	-	Male	530	Present	Unknown	Non-fresh	2.1	11	
10/31/2012	-	Male	800	Present	Unknown	Non-fresh	2.1	11	
10/31/2012	-	Male	900	Present	Unknown	Non-fresh	2.1	11	

Date	Sample	Sex	Fork Length	Adipose Fin Status	Spawn Status	Carcass Condition	Reach	Stream Mile	CWT Code
10/31/2012	-	Male	450	Present	Unknown	Non-fresh	2.1	11	
10/31/2012	1791	Male	490	Present	Unknown	Fresh	2.1	11	
10/31/2012	-	Male	870	Present	Unknown	Non-fresh	2.1	11	
10/31/2012	1792	Female	730	Present	Spawned	Fresh	2.1	11	
10/31/2012	-	Male	720	Present	Unknown	very non-fresh	2.1	11	
10/31/2012	-	Male	870	Present	Unknown	very non-fresh	2.1	11	
10/31/2012	-	Female	820	Present	Spawned	Non-fresh	2.1	11	
10/31/2012	1786	Male	490	Absent	Unknown	Non-fresh	2.1	12	068624
10/31/2012	1782	Male	510	Unknown	Unknown	Fresh	2.1	12	NTD
10/31/2012	1787	Male	800	Unknown	Unknown	Fresh	2.1	12	NTD
10/31/2012	1781	Male	800	Present	Unknown	Fresh	2.1	12	
10/31/2012	-	Female	750	Present	Unspawned	Very Non-Fresh	2.1	12	
10/31/2012	-	Male	820	Present	Unknown	Non-fresh	2.1	12	
10/31/2012	1783	Female	750	Present	Spawned	Fresh	2.1	12	
10/31/2012	1784	Male	800	Present	Unknown	Fresh	2.1	12	
10/31/2012	-	Male	790	Present	Unknown	Non-fresh	2.1	12	
10/31/2012	-	Male	810	Present	Unknown	very non-fresh	2.1	12	
10/31/2012	1785	Male	520	Present	Unknown	Fresh	2.1	12	
10/31/2012	-	Male	840	Present	Unknown	very non-fresh	2.1	12	
10/31/2012	-	Female	770	Present	Spawned	Non-fresh	2.1	12	
10/31/2012	-	Male	610	Present	Unknown	Non-fresh	2.1	12	
10/31/2012	-	Male	650	Present	Unknown	Non-fresh	2.1	12	
10/31/2012	-	Male	820	Present	Unknown	Non-fresh	2.1	12	
10/31/2012	1779	Male	550	Present	Unknown	Fresh	2.1	13	
10/31/2012	-	Male	630	Present	Unknown	Non-fresh	2.1	13	
10/31/2012	1780	Male	830	Present	Unknown	Fresh	2.1	13	
10/31/2012	1778	Female	840	Present	Spawned	Fresh	2.1	14	
11/5/2012	1929	Male	830	Absent	Unknown	very non-fresh	3	0	055194
11/5/2012	1928	Male	630	Absent	Unknown	very non-fresh	3	0	Lost
11/5/2012	-	Male	600	Present	Unknown	Non-fresh	3	0	
11/5/2012	-	Male	600	Present	Unknown	Non-fresh	3	0	
11/5/2012	-	Male	780	Present	Unknown	Very Non-Fresh	3	0	
11/5/2012	-	Male	560	Present	Unknown	very non-fresh	3	0	
11/5/2012	-	Male	520	Present	Unknown	very non-fresh	3	0	
11/5/2012	1926	Male	600	Absent	Unknown	Non-fresh	3	2	055384
11/5/2012	1925	Female	780	Present	Spawned	Fresh	3	2	
11/5/2012	1927	Male	480	Present	Unknown	Fresh	3	2	
11/5/2012	-	Female	780	Present	Spawned	Non-fresh	3	2	
11/5/2012	-	Male	570	Present	Unknown	very non-fresh	3	2	
11/5/2012	-	Male	780	Present	Unknown	very non-fresh	3	2	
11/5/2012	-	Male	720	Present	Unknown	Non-fresh	3	2	
11/5/2012	-	Male	870	Present	Unknown	Non-fresh	3	2	
11/5/2012	-	Female	700	Present	Spawned	Non-fresh	3	2	
11/5/2012	1924	Female	770	Absent	Spawned	Non-fresh	3	3	055199
11/5/2012	1923	Male	710	Absent	Unknown	Unknown	3	3	068671
11/5/2012	1922	Male	920	Absent	Unknown	Non-fresh	3	3	068672
11/5/2012	-	Male	750	Present	Unknown	very non-fresh	3	3	
11/5/2012	-	Female	830	Present	Spawned	Non-fresh	3	3	
11/5/2012	-	Female	760	Present	Spawned	Non-fresh	3	3	
11/5/2012	-	Male	720	Present	Unknown	Non-fresh	3	3	
11/5/2012	-	Male	560	Present	Unknown	Non-fresh	3	4	
11/5/2012	-	Female	730	Present	Spawned	Non-fresh	3	4	
11/5/2012	-	Male	640	Present	Unknown	Non-fresh	3	4	
11/5/2012	-	Female	780	Present	Spawned	Non-fresh	3	4	
11/5/2012	-	Female	720	Present	Spawned	Non-fresh	3	4	
11/5/2012	-	Female	790	Present	Spawned	very non-fresh	3	4	
11/5/2012	-	Female	670	Present	Spawned	Non-fresh	3	4	
11/5/2012	-	Female	740	Present	Spawned	very non-fresh	3	4	
11/5/2012	-	Female	820	Present	Spawned	Non-fresh	3	5	
11/5/2012	1919	Female	710	Present	Spawned	Fresh	3	5	
11/5/2012	-	Female	730	Present	Spawned	Non-fresh	3	5	
11/5/2012	-	Male	910	Present	Unknown	Non-fresh	3	5	
11/5/2012	-	Male	1010	Present	Unknown	Non-fresh	3	5	
11/5/2012	-	Male	940	Present	Unknown	Non-fresh	3	5	
11/5/2012	-	Female	750	Present	Spawned	very non-fresh	3	5	
11/5/2012	-	Female	810	Present	Spawned	very non-fresh	3	5	
11/5/2012	1920	Female	710	Present	Spawned	Fresh	3	5	
11/5/2012	-	Female	840	Present	Spawned	Non-fresh	3	5	
11/5/2012	1921	Female	750	Present	Spawned	Fresh	3	5	
11/5/2012	-	Female	730	Present	Spawned	very non-fresh	3	5	
11/5/2012	-	Male	950	Present	Unknown	very non-fresh	3	5	
11/5/2012	-	Male	950	Present	Unknown	Non-fresh	3	5	

Date	Sample	Sex	Fork Length	Adipose Fin Status	Spawn Status	Carcass Condition	Reach	Stream Mile	CWT Code
11/5/2012	-	Female	800	Present	Spawned	Non-fresh	3	5	
11/5/2012	-	Male	790	Present	Unknown	very non-fresh	3	5	
11/5/2012	1918	Female	900	Absent	Spawned	Non-fresh	3	6	068672
11/5/2012	-	Female	800	Present	Spawned	Non-fresh	3	6	
11/5/2012	-	Female	810	Present	Spawned	Non-fresh	3	6	
11/5/2012	-	Male	880	Present	Unknown	Non-fresh	3	6	
11/5/2012	-	Female	780	Present	Spawned	Non-fresh	3	6	
11/5/2012	-	Female	750	Present	Spawned	very non-fresh	3	6	
11/5/2012	-	Female	770	Present	Spawned	Non-fresh	3	6	
11/5/2012	-	Female	930	Present	Spawned	Non-fresh	3	6	
11/5/2012	-	Female	770	Present	Spawned	very non-fresh	3	6	
11/5/2012	-	Male	590	Present	Unknown	Non-fresh	3	6	
11/5/2012	-	Male	670	Present	Unknown	Non-fresh	3	6	
11/5/2012	-	Male	530	Present	Unknown	very non-fresh	3	6	
11/5/2012	1916	Male	790	Present	Unknown	Fresh	3	6	
11/5/2012	-	Female	750	Present	Spawned	very non-fresh	3	6	
11/5/2012	-	Female	750	Present	Spawned	Non-fresh	3	6	
11/5/2012	-	Male	820	Present	Unknown	Very Non-Fresh	3	6	
11/5/2012	-	Female	800	Present	Spawned	Non-fresh	3	6	
11/5/2012	-	Female	720	Present	Spawned	very non-fresh	3	6	
11/5/2012	1917	Male	840	Present	Unknown	Fresh	3	6	
11/5/2012	-	Male	1000	Present	Unknown	Non-fresh	3	6	
11/5/2012	-	Female	720	Present	Spawned	Non-fresh	3	6	
11/5/2012	-	Female	750	Present	Spawned	Non-fresh	3	6	
11/5/2012	-	Male	840	Present	Unknown	Non-fresh	3	6	
11/5/2012	-	Female	760	Present	Spawned	Non-fresh	3	6	
11/5/2012	-	Female	900	Present	Spawned	Non-fresh	3	6	
11/5/2012	-	Male	700	Present	Unknown	Non-fresh	3	6	
11/6/2012	1807	Male	530	Absent	Unknown	Non-fresh	2.2	6	055385
11/6/2012	1950	Female	750	Absent	Spawned	Non-fresh	2.2	6	068654
11/6/2012	-	Male	900	Present	Unknown	Non-fresh	2.2	6	
11/6/2012	-	Female	780	Present	Spawned	Non-fresh	2.2	6	
11/6/2012	-	Female	780	Present	Spawned	Non-fresh	2.2	6	
11/6/2012	1944	Male	800	Absent	Unknown	Non-fresh	2.2	7	055196
11/6/2012	1949	Male	820	Absent	Unknown	Fresh	2.2	7	055196
11/6/2012	1947	Male	890	Absent	Unknown	Fresh	2.2	7	055198
11/6/2012	1945	Male	580	Absent	Unknown	Non-fresh	2.2	7	055386
11/6/2012	-	Female	750	Present	Spawned	Non-fresh	2.2	7	
11/6/2012	-	Female	740	Present	Spawned	Non-fresh	2.2	7	
11/6/2012	-	Female	740	Present	Spawned	very non-fresh	2.2	7	
11/6/2012	1946	Female	860	Present	Spawned	Fresh	2.2	7	
11/6/2012	-	Female	820	Present	Spawned	Non-fresh	2.2	7	
11/6/2012	-	Male	620	Present	Unknown	Non-fresh	2.2	7	
11/6/2012	-	Male	600	Present	Unknown	Non-fresh	2.2	7	
11/6/2012	-	Female	720	Present	Spawned	Non-fresh	2.2	7	
11/6/2012	-	Male	790	Present	Unknown	Non-fresh	2.2	7	
11/6/2012	-	Female	720	Present	Spawned	Non-fresh	2.2	7	
11/6/2012	-	Male	600	Present	Unknown	Non-fresh	2.2	7	
11/6/2012	-	Female	790	Present	Spawned	Non-fresh	2.2	7	
11/6/2012	-	Male	840	Present	Unknown	very non-fresh	2.2	7	
11/6/2012	-	Male	620	Present	Unknown	Non-fresh	2.2	7	
11/6/2012	-	Female	720	Present	Spawned	very non-fresh	2.2	7	
11/6/2012	-	Female	720	Present	Spawned	Non-fresh	2.2	7	
11/6/2012	-	Female	740	Present	Spawned	Non-fresh	2.2	7	
11/6/2012	1948	Female	690	Present	Spawned	Fresh	2.2	7	
11/6/2012	-	Male	900	Present	Unknown	Non-fresh	2.2	7	
11/6/2012	-	Female	720	Present	Spawned	Non-fresh	2.2	7	
11/6/2012	-	Female	750	Present	Spawned	Non-fresh	2.2	7	
11/6/2012	-	Male	840	Present	Unknown	Non-fresh	2.2	7	
11/6/2012	-	Male	790	Present	Unknown	Non-fresh	2.2	7	
11/6/2012	-	Male	580	Present	Unknown	Non-fresh	2.2	7	
11/6/2012	-	Female	770	Present	Spawned	Non-fresh	2.2	7	
11/6/2012	-	Female	850	Present	Spawned	Non-fresh	2.2	7	
11/6/2012	-	Male	880	Present	Unknown	Non-fresh	2.2	7	
11/6/2012	-	Female	770	Present	Spawned	Non-fresh	2.2	7	
11/6/2012	-	Female	760	Present	Spawned	Non-fresh	2.2	7	
11/6/2012	-	Female	700	Present	Spawned	Non-fresh	2.2	7	
11/6/2012	-	Male	830	Present	Unknown	Non-fresh	2.2	7	
11/6/2012	-	Male	1000	Present	Unknown	Non-fresh	2.2	7	
11/6/2012	-	Female	710	Present	Spawned	Non-fresh	2.2	7	
11/6/2012	-	Female	690	Present	Spawned	Non-fresh	2.2	7	
11/6/2012	-	Female	740	Present	Spawned	Non-fresh	2.2	7	

Date	Sample	Sex	Fork Length	Adipose Fin Status	Spawn Status	Carcass Condition	Reach	Stream Mile	CWT Code
11/6/2012	-	Female	850	Present	Spawned	Non-fresh	2.2	7	
11/6/2012	-	Female	800	Present	Spawned	Non-fresh	2.2	7	
11/6/2012	-	Female	740	Present	Spawned	Non-fresh	2.2	7	
11/6/2012	-	Female	790	Present	Spawned	Non-fresh	2.2	7	
11/6/2012	-	Female	720	Present	Spawned	Non-fresh	2.2	7	
11/6/2012	-	Female	820	Present	Spawned	Non-fresh	2.2	7	
11/6/2012	-	Female	780	Present	Spawned	Non-fresh	2.2	7	
11/6/2012	-	Male	820	Present	Unknown	Non-fresh	2.2	7	
11/6/2012	1940	Male	780	Unknown	Unknown	Non-fresh	2.2	8	068668
11/6/2012	1943	Female	730	Absent	Spawned	Non-fresh	2.2	8	068672
11/6/2012	-	Female	740	Present	Spawned	Non-fresh	2.2	8	
11/6/2012	-	Female	820	Present	Spawned	Non-Fresh	2.2	8	
11/6/2012	-	Male	670	Present	Unknown	Non-fresh	2.2	8	
11/6/2012	1941	Female	870	Present	Spawned	Fresh	2.2	8	
11/6/2012	-	Female	730	Present	Spawned	Non-fresh	2.2	8	
11/6/2012	-	Male	850	Present	Unknown	Non-fresh	2.2	8	
11/6/2012	-	Male	860	Present	Unknown	Non-fresh	2.2	8	
11/6/2012	-	Female	820	Present	Spawned	Non-fresh	2.2	8	
11/6/2012	-	Female	740	Present	Spawned	Non-fresh	2.2	8	
11/6/2012	-	Female	730	Present	Spawned	Non-fresh	2.2	8	
11/6/2012	1942	Female	730	Present	Spawned	Fresh	2.2	8	
11/6/2012	-	Female	740	Present	Spawned	Non-fresh	2.2	8	
11/6/2012	-	Male	790	Present	Unknown	Non-fresh	2.2	8	
11/6/2012	-	Female	760	Present	Spawned	Non-fresh	2.2	8	
11/6/2012	-	Male	650	Present	Unknown	Non-fresh	2.2	8	
11/6/2012	-	Female	780	Present	Spawned	Non-fresh	2.2	8	
11/6/2012	-	Female	790	Present	Spawned	Non-fresh	2.2	8	
11/6/2012	-	Female	740	Present	Spawned	Non-fresh	2.2	8	
11/6/2012	-	Male	480	Present	Unknown	Non-fresh	2.2	8	
11/6/2012	-	Male	760	Present	Unknown	Non-fresh	2.2	8	
11/6/2012	-	Male	520	Present	Unknown	Non-fresh	2.2	8	
11/6/2012	-	Female	830	Present	Spawned	Non-fresh	2.2	8	
11/6/2012	-	Female	840	Present	Spawned	Non-fresh	2.2	8	
11/6/2012	-	Female	730	Present	Spawned	very non-fresh	2.2	8	
11/6/2012	-	Female	800	Present	Spawned	Non-fresh	2.2	8	
11/6/2012	1937	Female	730	Absent	Spawned	Non-fresh	2.2	9	068654
11/6/2012	1936	Male	790	Absent	Unknown	Fresh	2.2	9	068672
11/6/2012	1932	Male	920	Absent	Unknown	Non-fresh	2.2	9	068672
11/6/2012	1930	Female	740	Unknown	Spawned	Non-fresh	2.2	9	NTD
11/6/2012	-	Female	780	Present	Spawned	Non-fresh	2.2	9	
11/6/2012	1931	Female	820	Present	Spawned	Fresh	2.2	9	
11/6/2012	-	Male	580	Present	Unknown	Non-fresh	2.2	9	
11/6/2012	-	Male	540	Present	Unknown	Non-fresh	2.2	9	
11/6/2012	-	Male	810	Present	Unknown	Non-fresh	2.2	9	
11/6/2012	-	Female	750	Present	Spawned	Non-fresh	2.2	9	
11/6/2012	-	Male	690	Present	Unknown	Non-fresh	2.2	9	
11/6/2012	1938	Female	860	Present	Spawned	Fresh	2.2	9	
11/6/2012	-	Male	920	Present	Unknown	Non-fresh	2.2	9	
11/6/2012	-	Female	820	Present	Spawned	Non-fresh	2.2	9	
11/6/2012	-	Female	840	Present	Spawned	Non-fresh	2.2	9	
11/6/2012	-	Male	520	Present	Unknown	Non-fresh	2.2	9	
11/6/2012	-	Female	810	Present	Spawned	Non-fresh	2.2	9	
11/6/2012	-	Male	620	Present	Unknown	Non-fresh	2.2	9	
11/6/2012	-	Female	810	Present	Spawned	Non-fresh	2.2	9	
11/6/2012	-	Female	720	Present	Spawned	Non-fresh	2.2	9	
11/6/2012	-	Male	780	Present	Unknown	Non-fresh	2.2	9	
11/6/2012	-	Male	530	Present	Unknown	Non-fresh	2.2	9	
11/6/2012	-	Male	840	Present	Unknown	Non-fresh	2.2	9	
11/6/2012	-	Male	580	Present	Unknown	Non-fresh	2.2	9	
11/6/2012	-	Female	820	Present	Spawned	Non-fresh	2.2	9	
11/6/2012	-	Male	910	Present	Unknown	Non-fresh	2.2	9	
11/6/2012	-	Female	840	Present	Spawned	Non-fresh	2.2	9	
11/6/2012	-	Male	590	Present	Unknown	Non-fresh	2.2	9	
11/6/2012	-	Male	900	Present	Unknown	Non-fresh	2.2	9	
11/6/2012	-	Female	580	Present	Spawned	Non-fresh	2.2	9	
11/6/2012	1934	Female	740	Present	Spawned	Fresh	2.2	9	
11/6/2012	-	Female	850	Present	Spawned	Non-fresh	2.2	9	
11/6/2012	-	Male	720	Present	Unknown	Non-fresh	2.2	9	
11/6/2012	-	Female	720	Present	Spawned	Non-fresh	2.2	9	
11/6/2012	1935	Female	830	Present	Spawned	Fresh	2.2	9	
11/6/2012	-	Female	790	Present	Spawned	Non-fresh	2.2	9	
11/6/2012	-	Female	820	Present	Spawned	Non-fresh	2.2	9	

Date	Sample	Sex	Fork Length	Adipose Fin Status	Spawn Status	Carcass Condition	Reach	Stream Mile	CWT Code
11/6/2012	-	Female	550	Present	Spawned	Non-fresh	2.2	9	
11/6/2012	-	Male	580	Present	Unknown	Non-fresh	2.2	9	
11/6/2012	-	Female	860	Present	Spawned	Non-fresh	2.2	9	
11/6/2012	-	Male	830	Present	Unknown	Non-fresh	2.2	9	
11/6/2012	1933	Female	800	Present	Spawned	Fresh	2.2	9	
11/6/2012	-	Male	730	Present	Unknown	Non-fresh	2.2	9	
11/6/2012	-	Female	810	Present	Spawned	Non-fresh	2.2	9	
11/6/2012	-	Male	670	Present	Unknown	very non-fresh	2.2	9	
11/6/2012	-	Male	790	Present	Unknown	very non-fresh	2.2	9	
11/6/2012	-	Male	860	Present	Unknown	Non-fresh	2.2	9	
11/6/2012	-	Male	560	Present	Unknown	Non-fresh	2.2	9	
11/6/2012	-	Male	850	Present	Unknown	Non-fresh	2.2	9	
11/6/2012	1939	Female	820	Present	Spawned	Fresh	2.2	9	
11/6/2012	-	Female	860	Present	Spawned	Non-fresh	2.2	9	
11/6/2012	-	Male	860	Present	Unknown	Non-fresh	2.2	9	
11/7/2012	1823	Male	620	Absent	Unknown	Fresh	2.1	10	055378
11/7/2012	1821	Female	810	Absent	Spawned	Very Non-Fresh	2.1	10	068675
11/7/2012	1814	Female	760	Absent	Spawned	Non-fresh	2.1	10	068695
11/7/2012	-	Male	580	Present	Unknown	Non-fresh	2.1	10	
11/7/2012	-	Male	830	Present	Unknown	Non-fresh	2.1	10	
11/7/2012	-	Female	590	Present	Spawned	Non-fresh	2.1	10	
11/7/2012	-	Female	840	Present	Spawned	Non-fresh	2.1	10	
11/7/2012	-	Male	790	Present	Unknown	Non-fresh	2.1	10	
11/7/2012	-	Male	670	Present	Unknown	Non-fresh	2.1	10	
11/7/2012	-	Male	760	Present	Unknown	Non-fresh	2.1	10	
11/7/2012	-	Male	540	Present	Unknown	Non-fresh	2.1	10	
11/7/2012	1815	Male	920	Present	Unknown	Fresh	2.1	10	
11/7/2012	-	Female	640	Present	Spawned	Non-fresh	2.1	10	
11/7/2012	-	Male	680	Present	Unknown	Non-fresh	2.1	10	
11/7/2012	1816	Female	820	Present	Unspawned	Fresh	2.1	10	
11/7/2012	-	Female	740	Present	Spawned	Non-fresh	2.1	10	
11/7/2012	-	Male	900	Present	Unknown	Very Non-Fresh	2.1	10	
11/7/2012	1817	Male	880	Present	Unknown	Fresh	2.1	10	
11/7/2012	1818	Female	800	Present	Spawned	Fresh	2.1	10	
11/7/2012	1819	Female	760	Present	Spawned	Fresh	2.1	10	
11/7/2012	-	Female	830	Present	Spawned	Non-fresh	2.1	10	
11/7/2012	-	Male	970	Present	Unknown	Very Non-Fresh	2.1	10	
11/7/2012	-	Male	830	Present	Unknown	Non-fresh	2.1	10	
11/7/2012	1820	Male	810	Present	Unknown	Fresh	2.1	10	
11/7/2012	-	Female	740	Present	Spawned	Non-fresh	2.1	10	
11/7/2012	-	Female	780	Present	Spawned	Very Non-Fresh	2.1	10	
11/7/2012	-	Male	820	Present	Unknown	Non-fresh	2.1	10	
11/7/2012	-	Female	780	Present	Spawned	Very Non-Fresh	2.1	10	
11/7/2012	-	Female	740	Present	Spawned	Non-fresh	2.1	10	
11/7/2012	-	Female	700	Present	Spawned	Non-fresh	2.1	10	
11/7/2012	-	Male	900	Present	Unknown	Non-fresh	2.1	10	
11/7/2012	1822	Female	800	Present	Spawned	Fresh	2.1	10	
11/7/2012	-	Male	870	Present	Unknown	Non-fresh	2.1	10	
11/7/2012	-	Female	840	Present	Spawned	Non-fresh	2.1	10	
11/7/2012	-	Female	780	Present	Spawned	Non-fresh	2.1	10	
11/7/2012	-	Female	830	Present	Spawned	Very Non-Fresh	2.1	10	
11/7/2012	-	Female	800	Present	Spawned	Non-fresh	2.1	10	
11/7/2012	-	Female	760	Present	Spawned	Very Non-Fresh	2.1	10	
11/7/2012	-	Female	810	Present	Spawned	Very Non-Fresh	2.1	10	
11/7/2012	-	Female	780	Present	Spawned	Non-fresh	2.1	10	
11/7/2012	-	Female	790	Present	Spawned	Non-fresh	2.1	10	
11/7/2012	-	Male	840	Present	Unknown	Non-fresh	2.1	10	
11/7/2012	-	Male	860	Present	Unknown	Very Non-Fresh	2.1	10	
11/7/2012	1811	Female	700	Absent	Spawned	Non-fresh	2.1	11	068654
11/7/2012	-	Male	720	Present	Unknown	Non-fresh	2.1	11	
11/7/2012	-	Female	720	Present	Unspawned	Non-fresh	2.1	11	
11/7/2012	-	Male	820	Present	Unknown	Non-fresh	2.1	11	
11/7/2012	-	Female	850	Present	Spawned	Non-fresh	2.1	11	
11/7/2012	-	Female	750	Present	Spawned	Non-fresh	2.1	11	
11/7/2012	-	Female	800	Present	Spawned	Fresh	2.1	11	
11/7/2012	-	Male	840	Present	Unknown	Non-fresh	2.1	11	
11/7/2012	-	Female	730	Present	Spawned	Non-fresh	2.1	11	
11/7/2012	-	Female	760	Present	Spawned	Non-fresh	2.1	11	
11/7/2012	-	Female	770	Present	Spawned	Non-fresh	2.1	11	
11/7/2012	-	Female	740	Present	Spawned	Non-fresh	2.1	11	
11/7/2012	1812	Male	840	Present	Unknown	Fresh	2.1	11	
11/7/2012	1813	Female	690	Present	Spawned	Fresh	2.1	11	

Date	Sample	Sex	Fork Length	Adipose Fin Status	Spawn Status	Carcass Condition	Reach	Stream Mile	CWT Code
11/7/2012	-	Female	730	Present	Spawned	Non-fresh	2.1	11	
11/7/2012	1809	Female	770	Absent	Spawned	Non-fresh	2.1	12	NTD
11/7/2012	-	Male	750	Present	Unknown	Non-fresh	2.1	12	
11/7/2012	1808	Female	790	Present	Spawned	Fresh	2.1	12	
11/7/2012	-	Male	970	Present	Unknown	Non-fresh	2.1	12	
11/7/2012	-	Male	870	Present	Unknown	Non-fresh	2.1	12	
11/7/2012	-	Female	810	Present	Spawned	Non-fresh	2.1	12	
11/7/2012	-	Female	780	Present	Spawned	Non-fresh	2.1	12	
11/7/2012	-	Female	910	Present	Spawned	Non-fresh	2.1	12	
11/7/2012	-	Male	830	Present	Unknown	Non-fresh	2.1	12	
11/7/2012	-	Male	810	Present	Unknown	Non-fresh	2.1	12	
11/7/2012	-	Female	820	Present	Spawned	Non-fresh	2.1	12	
11/7/2012	-	Female	780	Present	Spawned	Non-fresh	2.1	12	
11/7/2012	-	Male	900	Present	Unknown	Non-fresh	2.1	12	
11/7/2012	-	Female	780	Present	Spawned	Non-fresh	2.1	12	
11/7/2012	-	Male	590	Present	Unknown	Non-fresh	2.1	12	
11/7/2012	-	Male	890	Present	Unknown	Non-fresh	2.1	12	
11/7/2012	-	Male	580	Present	Unknown	Non-fresh	2.1	12	
11/7/2012	-	Male	580	Present	Unknown	Very Non-Fresh	2.1	12	
11/7/2012	-	Female	700	Present	Spawned	Non-fresh	2.1	12	
11/7/2012	-	Female	0	Present	Spawned	Non-fresh	2.1	12	
11/7/2012	1810	Female	700	Present	Spawned	Fresh	2.1	12	
11/7/2012	-	Male	840	Present	Unknown	Non-fresh	2.1	12	
11/7/2012	-	Female	790	Present	Spawned	Non-fresh	2.1	12	
11/7/2012	-	Male	600	Present	Unknown	Non-fresh	2.1	13	
11/7/2012	-	Female	800	Present	Spawned	Non-fresh	2.1	13	
11/7/2012	-	Female	790	Present	Spawned	Non-fresh	2.1	13	
11/7/2012	2054	Male	580	Unknown	Unknown	Very Non-Fresh	1	14	NTD
11/7/2012	-	Female	810	Present	Spawned	Non-Fresh	1	14	
11/7/2012	2053	Male	720	Present	Unknown	Fresh	1	14	
11/7/2012	-	Male	850	Present	Unknown	Non-Fresh	1	14	
11/7/2012	-	Male	560	Present	Unknown	Non-Fresh	1	14	
11/7/2012	-	Female	830	Present	Spawned	Non-Fresh	1	14	
11/7/2012	-	Male	890	Present	Unknown	Non-Fresh	1	14	
11/7/2012	-	Female	860	Present	Spawned	Very Non-Fresh	1	14	
11/7/2012	-	Male	870	Present	Unknown	Non-Fresh	1	14	
11/7/2012	-	Male	550	Present	Unknown	Very Non-Fresh	1	14	
11/7/2012	-	Male	750	Present	Unknown	Non-Fresh	1	14	
11/7/2012	-	Male	570	Present	Unknown	Non-Fresh	1	14	
11/7/2012	-	Male	880	Present	Unknown	Non-Fresh	1	14	
11/7/2012	-	Male	930	Present	Unknown	Non-Fresh	1	14	
11/7/2012	-	Male	800	Present	Unknown	Non-Fresh	1	14	
11/7/2012	-	Male	840	Present	Unknown	Very Non-Fresh	1	14	
11/7/2012	-	Male	630	Present	Unknown	Very Non-Fresh	1	14	
11/7/2012	-	Male	620	Present	Unknown	Non-Fresh	1	14	
11/7/2012	-	Male	820	Present	Unknown	Very Non-Fresh	1	14	
11/7/2012	2055	Male	820	Present	Unknown	Non-Fresh	1	14	
11/7/2012	-	Male	600	Present	Unknown	Non-Fresh	1	14	
11/7/2012	-	Female	790	Present	Spawned	Non-Fresh	1	14	
11/7/2012	-	Male	590	Present	Unknown	Very Non-Fresh	1	14	
11/7/2012	2056	Male	820	Present	Unknown	Fresh	1	14	
11/7/2012	-	Female	780	Present	Spawned	Non-Fresh	1	14	
11/7/2012	-	Female	740	Present	Spawned	Non-Fresh	1	14	
11/7/2012	2050	Male	810	Absent	Unknown	Non-Fresh	1	15	068671
11/7/2012	-	Male	550	Present	Unknown	Non-Fresh	1	15	
11/7/2012	-	Male	580	Present	Unknown	Non-Fresh	1	15	
11/7/2012	2051	Male	820	Present	Unknown	Fresh	1	15	
11/7/2012	-	Male	540	Present	Unknown	Very Non-Fresh	1	15	
11/7/2012	-	Female	770	Present	Spawned	Non-Fresh	1	15	
11/7/2012	2052	Female	590	Present	Spawned	Fresh	1	15	
11/7/2012	-	Male	860	Present	Unknown	Non-Fresh	1	16	
11/7/2012	-	Female	810	Present	Spawned	Non-Fresh	1	16	
11/7/2012	-	Male	540	Present	Unknown	Non-Fresh	1	16	
11/7/2012	2044	Male	930	Present	Unknown	Fresh	1	16	
11/7/2012	-	Male	580	Present	Unknown	Non-Fresh	1	16	
11/7/2012	2045	Male	570	Present	Unknown	Fresh	1	16	
11/7/2012	-	Male	580	Present	Unknown	Non-Fresh	1	16	
11/7/2012	2046	Female	740	Present	Spawned	Fresh	1	16	
11/7/2012	-	Male	570	Present	Unknown	Non-Fresh	1	16	
11/7/2012	2047	Female	780	Present	Spawned	Fresh	1	16	
11/7/2012	-	Male	590	Present	Unknown	Non-Fresh	1	16	
11/7/2012	2048	Male	870	Present	Unknown	Fresh	1	16	

Date	Sample	Sex	Fork Length	Adipose Fin Status	Spawn Status	Carcass Condition	Reach	Stream Mile	CWT Code
11/7/2012	-	Female	840	Present	Spawned	Non-Fresh	1	16	
11/7/2012	-	Male	800	Present	Unknown	Non-Fresh	1	16	
11/7/2012	-	Male	840	Present	Unknown	Non-Fresh	1	16	
11/7/2012	2049	Male	870	Present	Unknown	Fresh	1	16	
11/7/2012	-	Female	740	Present	Spawned	Non-Fresh	1	17	
11/7/2012	-	Male	900	Present	Unknown	Non-Fresh	1	17	
11/7/2012	2042	Male	860	Present	Unknown	Fresh	1	17	
11/7/2012	-	Male	770	Present	Unknown	Non-Fresh	1	17	
11/7/2012	2043	Female	800	Present	Spawned	Fresh	1	17	
11/7/2012	-	Male	920	Present	Unknown	Non-Fresh	1	17	
11/7/2012	-	Male	530	Present	Unknown	Non-Fresh	1	17	
11/7/2012	-	Male	520	Present	Unknown	Non-Fresh	1	17	
11/7/2012	-	Female	880	Present	Spawned	Non-Fresh	1	17	
11/7/2012	-	Male	810	Present	Unknown	Non-Fresh	1	17	
11/7/2012	-	Male	840	Present	Unknown	Non-Fresh	1	17	
11/7/2012	-	Male	690	Present	Unknown	Non-Fresh	1	17	
11/7/2012	-	Male	500	Present	Unknown	Non-Fresh	1	17	
11/7/2012	-	Female	800	Present	Spawned	Non-Fresh	1	18	
11/7/2012	-	Male	490	Present	Unknown	Non-Fresh	1	18	
11/7/2012	-	Male	590	Present	Unknown	Non-Fresh	1	19	
11/7/2012	2041	Female	780	Present	Spawned	Fresh	1	19	
11/13/2012	-	Male	720	Present	Unknown	Non-fresh	3	0	
11/13/2012	-	Male	580	Present	Unknown	Non-fresh	3	0	
11/13/2012	-	Female	770	Present	Spawned	Non-fresh	3	0	
11/13/2012	2064	Female	820	Present	Spawned	Fresh	3	1	
11/13/2012	-	Female	800	Present	Spawned	Non-fresh	3	2	
11/13/2012	-	Male	780	Present	Unknown	very non-fresh	3	2	
11/13/2012	-	Male	600	Present	Unknown	Non-fresh	3	2	
11/13/2012	-	Male	540	Present	Unknown	Non-fresh	3	2	
11/13/2012	-	Female	760	Present	Spawned	very non-fresh	3	2	
11/13/2012	-	Male	970	Present	Unknown	very non-fresh	3	2	
11/13/2012	2061	Female	760	Absent	Spawned	Non-fresh	3	3	068654
11/13/2012	-	Female	760	Present	Spawned	Non-fresh	3	3	
11/13/2012	-	Male	850	Present	Unknown	Very Non-Fresh	3	3	
11/13/2012	-	Female	730	Present	Spawned	Non-fresh	3	3	
11/13/2012	2059	Male	850	Present	Unknown	Fresh	3	3	
11/13/2012	2060	Male	670	Present	Unknown	Fresh	3	3	
11/13/2012	-	Female	820	Present	Spawned	Non-fresh	3	3	
11/13/2012	-	Female	850	Present	Spawned	Very Non-Fresh	3	3	
11/13/2012	-	Female	700	Present	Spawned	very non-fresh	3	3	
11/13/2012	-	Female	760	Present	Spawned	Non-fresh	3	3	
11/13/2012	2062	Female	790	Present	Spawned	Fresh	3	3	
11/13/2012	-	Male	830	Present	Unknown	very non-fresh	3	3	
11/13/2012	2063	Female	810	Present	Spawned	Fresh	3	3	
11/13/2012	-	Male	820	Present	Unknown	Non-fresh	3	3	
11/13/2012	2058	Female	750	Absent	Spawned	Fresh	3	4	068672
11/13/2012	-	Female	740	Present	Spawned	Non-fresh	3	4	
11/13/2012	-	Male	840	Present	Unknown	Non-fresh	3	4	
11/13/2012	-	Male	620	Present	Unknown	Non-fresh	3	4	
11/13/2012	-	Male	850	Present	Unknown	very non-fresh	3	4	
11/13/2012	-	Female	800	Present	Spawned	Non-fresh	3	5	
11/13/2012	-	Female	740	Present	Spawned	Non-fresh	3	5	
11/13/2012	-	Male	890	Present	Unknown	Non-fresh	3	5	
11/13/2012	-	Female	710	Present	Spawned	Non-fresh	3	5	
11/13/2012	-	Female	740	Present	Spawned	Non-fresh	3	5	
11/13/2012	-	Female	800	Present	Spawned	Non-fresh	3	5	
11/13/2012	-	Male	620	Present	Unknown	Non-fresh	3	5	
11/13/2012	-	Male	600	Present	Unknown	Non-fresh	3	5	
11/13/2012	2057	Male	830	Present	Unknown	Fresh	3	5	
11/13/2012	-	Female	840	Present	Spawned	Non-fresh	3	6	
11/13/2012	-	Female	820	Present	Spawned	Non-fresh	3	6	
11/13/2012	-	Female	770	Present	Spawned	very non-fresh	3	6	
11/13/2012	-	Female	760	Present	Spawned	Non-fresh	3	6	
11/13/2012	-	Female	810	Present	Spawned	Non-fresh	3	6	
11/13/2012	-	Male	770	Present	Unknown	Non-fresh	3	6	
11/13/2012	-	Female	830	Present	Spawned	Non-fresh	3	6	
11/13/2012	-	Male	620	Present	Unknown	Non-fresh	3	6	
11/14/2012	1828	Male	530	Absent	Unknown	very non-fresh	2.1	10	NTD
11/14/2012	-	Female	780	Present	Spawned	very non-fresh	2.1	10	
11/14/2012	-	Male	650	Present	Unknown	Non-fresh	2.1	10	
11/14/2012	-	Male	600	Present	Unknown	Non-fresh	2.1	10	
11/14/2012	-	Female	790	Present	Spawned	Non-fresh	2.1	10	

Date	Sample	Sex	Fork Length	Adipose Fin Status	Spawn Status	Carcass Condition	Reach	Stream Mile	CWT Code
11/14/2012	1827	Male	580	Absent	Unknown	very non-fresh	2.1	11	055396
11/14/2012	-	Female	850	Present	Spawned	Non-fresh	2.1	11	
11/14/2012	-	Female	760	Present	Spawned	Non-fresh	2.1	11	
11/14/2012	-	Female	730	Present	Spawned	very non-fresh	2.1	11	
11/14/2012	-	Male	900	Present	Unknown	Non-fresh	2.1	11	
11/14/2012	1826	Male	780	Absent	Unknown	Non-fresh	2.1	12	068654
11/14/2012	-	Male	930	Present	Unknown	very non-fresh	2.1	12	
11/14/2012	-	Female	710	Present	Spawned	Non-fresh	2.1	12	
11/14/2012	-	Male	820	Present	Unknown	Non-fresh	2.1	12	
11/14/2012	-	Male	840	Present	Unknown	very non-fresh	2.1	12	
11/14/2012	-	Male	610	Present	Unknown	Very Non-Fresh	2.1	12	
11/14/2012	1824	Female	820	Present	Spawned	Fresh	2.1	13	
11/14/2012	1825	Female	770	Present	Spawned	Fresh	2.1	13	
11/14/2012	-	Female	770	Present	Spawned	Non-fresh	2.1	13	
11/14/2012	-	Male	780	Present	Unknown	very non-fresh	2.1	13	
11/14/2012	2066	Male	830	Present	Unknown	Fresh	1	14	
11/14/2012	-	Male	600	Present	Unknown	Non-fresh	1	14	
11/14/2012	-	Male	450	Present	Unknown	Non-fresh	1	15	
11/14/2012	2065	Male	890	Present	Unknown	Fresh	1	15	
11/14/2012	-	Female	740	Present	Spawned	Non-fresh	1	19	
11/15/2012	2072	Female	800	Unknown	Spawned	Fresh	2.2	7	NTD
11/15/2012	-	Female	730	Present	Spawned	Non-fresh	2.2	7	
11/15/2012	-	Male	780	Present	Unknown	Non-fresh	2.2	7	
11/15/2012	-	Male	890	Present	Unknown	Non-fresh	2.2	7	
11/15/2012	-	Female	740	Present	Spawned	very non-fresh	2.2	7	
11/15/2012	-	Male	530	Present	Unknown	Non-fresh	2.2	7	
11/15/2012	-	Female	780	Present	Spawned	Non-fresh	2.2	7	
11/15/2012	2070	Female	780	Absent	Spawned	Non-fresh	2.2	8	068654
11/15/2012	2068	Female	700	Unknown	Spawned	Non-fresh	2.2	8	068672
11/15/2012	-	Female	740	Present	Spawned	Non-fresh	2.2	8	
11/15/2012	-	Female	740	Present	Spawned	Non-fresh	2.2	8	
11/15/2012	-	Female	620	Present	Spawned	Non-fresh	2.2	8	
11/15/2012	2069	Female	760	Present	Spawned	Fresh	2.2	8	
11/15/2012	2071	Female	770	Present	Spawned	Fresh	2.2	8	
11/15/2012	-	Female	740	Present	Spawned	Non-fresh	2.2	8	
11/15/2012	-	Female	730	Present	Spawned	Non-fresh	2.2	8	
11/15/2012	-	Female	680	Present	Spawned	Non-fresh	2.2	9	
11/15/2012	-	Female	880	Present	Spawned	Non-fresh	2.2	9	
11/15/2012	-	Male	600	Present	Unknown	Non-fresh	2.2	9	
11/15/2012	-	Female	750	Present	Spawned	Non-fresh	2.2	9	
11/15/2012	-	Male	600	Present	Unknown	Non-fresh	2.2	9	
11/15/2012	2067	Male	800	Present	Unknown	Fresh	2.2	9	
11/19/2012	2073	Female	700	Absent	Spawned	Non-fresh	3	0	055196
11/19/2012	-	Male	800	Present	Unknown	Non-fresh	3	0	
11/19/2012	-	Female	740	Present	Spawned	Non-fresh	3	1	
11/19/2012	-	Female	740	Present	Spawned	Non-fresh	3	4	
11/19/2012	-	Male	610	Present	Unknown	Non-fresh	3	6	
11/19/2012	-	Male	840	Present	Unknown	Non-fresh	2	7	
11/19/2012	-	Male	860	Present	Unknown	Non-fresh	2	8	
11/19/2012	-	Male	890	Present	Unknown	Non-fresh	2	8	
11/19/2012	-	Male	840	Present	Unknown	Non-fresh	2	9	
11/19/2012	-	Female	790	Present	Spawned	Very Non-Fresh	2	10	
11/19/2012	1829	Male	810	Present	Unknown	Fresh	2	11	
11/19/2012	-	Male	760	Present	Unknown	Very Non-Fresh	2	12	
11/19/2012	-	Male	870	Present	Unknown	Non-fresh	2	13	
11/27/2012	-	Female	690	Present	Spawned	Non-fresh	2	7	
11/27/2012	2075	Male	880	Present	Unknown	Fresh	2	9	
11/27/2012	-	Male	600	Present	Unknown	Non-fresh	2	11	
11/27/2012	-	Male	800	Present	Unknown	Non-fresh	2	11	
11/27/2012	2074	Female	790	Present	Spawned	Fresh	2	11	

Table A. 3. Hatchery releases of fall Chinook salmon in the Central Valley for brood years 2008, 2009, and 2010. These are release summaries age-2, age-3 and age-4 salmon in 2012 from hatcheries in California's Central Valley (Coleman National Fish Hatchery (NFH), Feather River Fish Hatchery and the Feather River Hatchery Annex, Nimbus Fish Hatchery, Mokelumne River Fish Hatchery, and Merced River Fish Hatchery). This is a summary of likely fish that may have been encountered during the survey. Data was obtained from the Regional Mark Information System (RMIS) database (www.rmpc.org).

Hatchery	Run	Release Location	Brood Year	Total Released	Number Recovered	Expanded Number
Coleman National Fish Hatchery	Fall	Coleman NFH	2008	12,529,458		
			2009	10,210,147	13	52.1
			2010	11,369,732	6	24
		Sacramento River Colusa To Red Bluff Diversion Dam	2008	368,609		
			2009	484,432		
		Mare Island Net Pen	2010	1,339,659	2	8
		Mare Island at Minor Point	2008	1,059,183		
			2009	874,800	11	44.2
Feather River Fish Hatchery	Fall	San Pablo Bay Net Pens	2008	7,013,128		
			2009	7,411,675	19	76.3
			2010	6,440,475		
		Wickland Oil Net Pen	2008	180,004		
			2009	2,124,375	10	16.4
			2010	3,868,247	1	4
		Mare Island Net Pen	2008	373,241		
		Tiburon Net Pens	2008	78,123		
			2009	41,873	4	4.1
			2010	41,952		
		Santa Cruz Harbor Net Pens	2009	122,334	1	1
			2010	187,022		
Mokelumne River Fish Hatchery	Fall	San Joaquin River Sherman Island Opposite Jersey Point	2008	250,969		
			2010	1,898,828		
		Mokelumne River Fish Installation Weir	2009	99,157		
			2010	100,467		
		San Joaquin Sherman Island Net Pen	2009	2,023,958		
			2010	4,548,348		
Merced River Fish Hatchery	Fall	San Joaquin River at Jersey Point	2008	34,532		
			2009	165,213		
		San Joaquin River at Mossdale	2010	6,762		

Hatchery	Run	Release Location	Brood Year	Total Released	Number Recovered	Expanded Number
		Hatfield State Area	2010	51,404		
		Merced River Fish Facility	2010	76,971		
Nimbus Fish Hatchery	Fall	Mare Island Net Pens	2008	3,924,887		
			2009	1,391,632		
		American River	2008	270,000		
		Sacramento River At Discovery Park	2009	2,946,623		
			2010	2,988,697		
		American River At Sunrise	2009	274,514		
			2010	271,171		
		Wickland Oil Net Pen	2010	1,595,731		
Total				89,038,333	67	230.1